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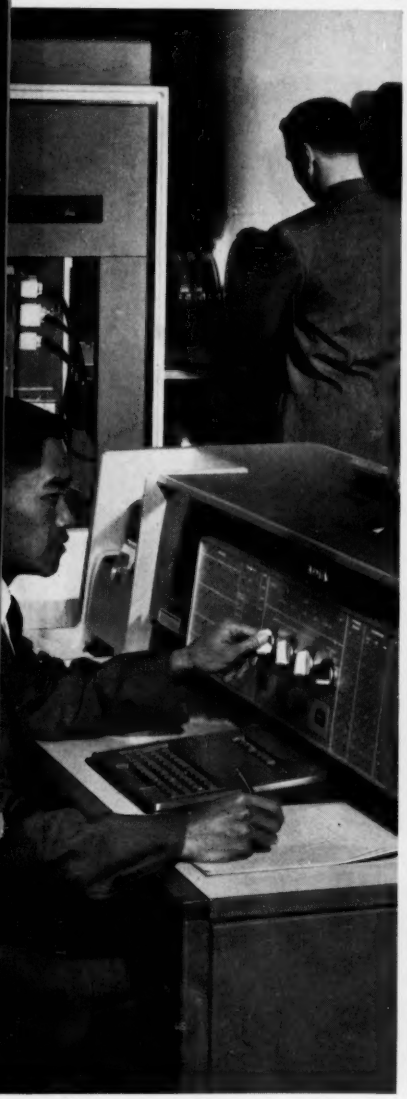
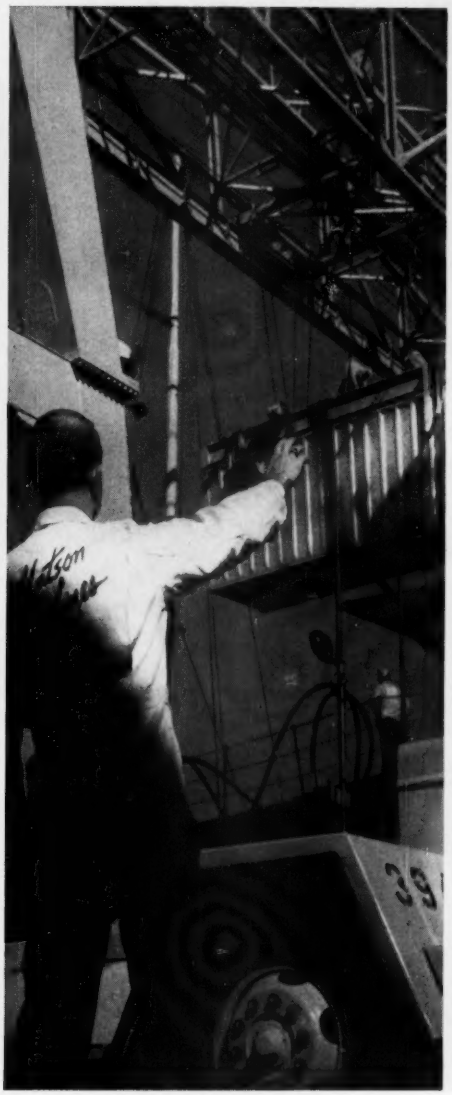
OCTOBER 1959 $1.00

FOOD ENGINEERING

FOR MANAGEMENT
IN MANUFACTURING,
PACKAGING, MARKETING

A McGRAW-HILL PUBLICATION



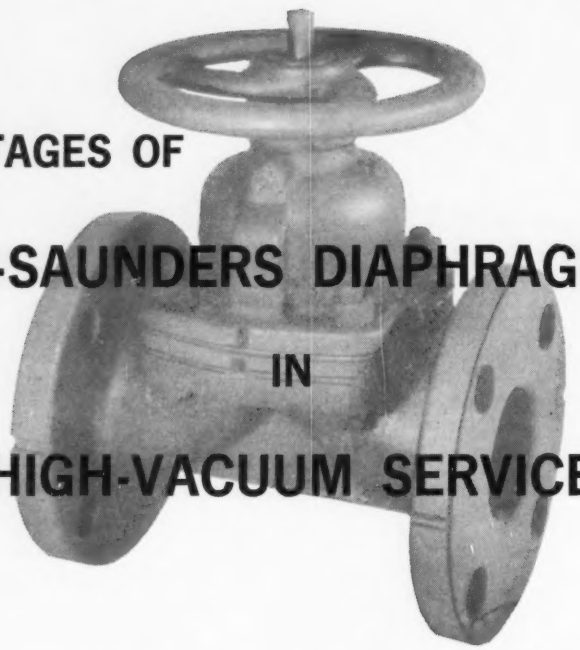


Sharper analyses... ...better distribution... ...new products are—

Key Weapons for Fighting Private Labels p.52

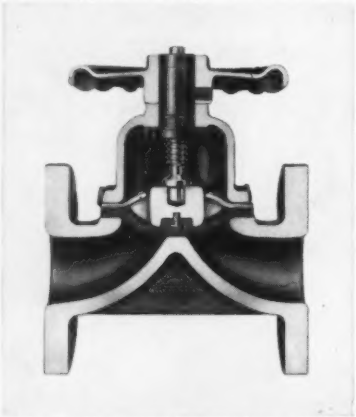
GRINNELL REPORTS ON VALVES:

THE ADVANTAGES OF GRINNELL-SAUNDERS DIAPHRAGM VALVES IN HIGH-VACUUM SERVICE



Dependable performance and long service life for vacuums down to 0.1 micron . . . with leak rates of less than 0.1 micron cubic foot/hour

One of the most important requirements of valves for high-vacuum service is that they must be vacuum-tight at all times during their operating cycle. Diaphragm valves of the Grinnell-Saunders manufacture fully meet this requirement. When clamped between the flanges of the body and bonnet, the

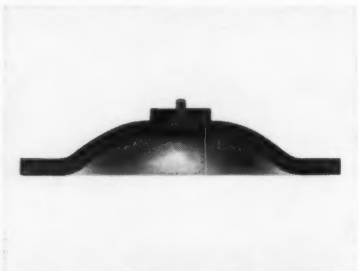


Valve provides vacuum-tight seal in closed position

diaphragm is easily made vacuum-tight down to 0.1 micron — with an in-leakage rate of less than 0.1 micron cubic foot/hour. Whether in the open, throttling or closed position, the diaphragm presents a smooth, unbroken face to the vacuum side of the chamber.

Rugged, nylon-reinforced diaphragms in a variety of materials

Grinnell has perfected a method of reinforcing its diaphragms with wear-resistant nylon. The result is a diaphragm that lasts longer at high-vacuum. The only part of the valve subject to service wear at any time is the diaphragm — which can easily be replaced in a matter of minutes, without removing the valve body from the system. Diaphragms are available in a wide choice of materials.



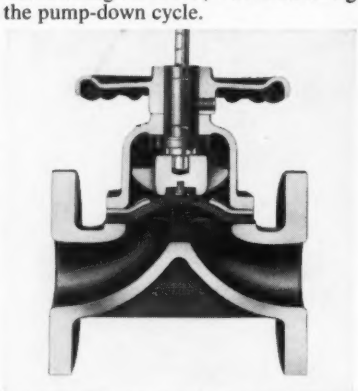
Rugged, reinforced nylon diaphragm gives long-lasting life

Contamination minimized

Construction of Grinnell-Saunders Diaphragm Valves provides separation of the working mechanism from the vacuum within the system. This isolation of lubricated working parts prevents contamination of the system from lubricant outgassing.

Large, unimpeded valve passage

The large passage of the Grinnell valve, in the open position, offers minimum impedance to the escape of random moving molecules in pumping down to high-vacuum, thus shortening the pump-down cycle.



In open position, valve passage is free and unimpeded

Special provisions:

Sealed bonnets are available for evacuation when required. Elastomer type diaphragms do not require evacuation of the bonnet. Valves with plastic diaphragms, used at elevated temperatures, do require evacuation of the bonnet for long diaphragm service life.

For more information

Get further facts about Grinnell-Saunders Diaphragm Valves. Learn, how the diaphragm lifts high for streamline flow in either direction . . . and how the diaphragm seals firmly against the body weir for leak-tight closure. Write to: — Grinnell Company, Providence 1, Rhode Island.

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You can assemble and build a system "custom-planned" to suit your individual needs with Handidrives and other Standard units available out of stock. This service enables you to adapt and change the system from time to time to meet varying requirements as they arise, at exceptionally low cost.

Handidrive conveyors may be individually leveled or inclined. Independent units may be purchased separately to construct power conveyors as desired.

Let Standard show *you* how to build or convert your own conveyor systems with Handidrives. Write: STANDARD CONVEYOR COMPANY. General Offices: North St. Paul 9, Minn.

Handidrive may be mounted at center or end. Standardized units may be purchased individually for extension to present conveyors, or as complete conveyors.

Ask Standard how to cut costs with conveyors

Send for Handidrive Bulletin No. 64. Write Dept. D-10.

Standard

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Sales and Service in Principal Cities

OVER 50 years of conveyor experience

Ask AMERICAN HOME FOODS

There is no surer way to decide whether an FMC "Sterilmatic"* line is *right* for you than to ask leading food processors who are now using these continuous pressure cookers and coolers.

Ask American Home Foods, Division of American Home Products Corp., for example. They installed their first "Sterilmatic" in 1946 in their Chef-Boy-ar-Dee plant at Milton, Pa.

During the years since then, they have specified "Sterilmatic" three times – now have 7 of these lines in the plant, turning out the 53 foods they pack under the famous Chef's label.

You will learn that "Sterilmatic" pioneered a new concept in food processing – one that invariably cuts processing time, assures uniform quality, helps preserve natural color, flavor, texture and nutrients, and minimizes can damage.

The list of "Sterilmatic" users reads like a Blue Book of food processors. Let their use-experience be your guide to better, more profitable food processing.

A 16-page brochure, "The Sterilmatic Story," gives full details and is yours for the asking. Write for it – today.

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TRENDS & FORECASTS

SPECIAL

FOOD ENGINEERING

SERVICE to EXECUTIVES

Year ahead can be extraordinarily good for American business, according to McGraw-Hill Department of Economics. Record levels of activity and profits already are in sight for '60.

Disposable personal income increased $8 billion in 2d quarter to $335 billion, 8% above recession low. Personal consumption expenditures were up $7.5 billion over 1st quarter, part going for increased food purchases.

Retail sales are 11% higher than year ago, says National Assn. of Retail Grocers. Volume may hit record $55 billion in '59.

Total crop production within 1% of last year's record is forecast by USDA. Index is 117% of '47-'49 average. Corn crop is put at record 4.38 billion bu., 16% above last year. Wheat is forecast at 1.12 billion bu., 23.7% under '58 but above 10-yr. average.

Research and development expenditures of food and beverage companies will be 10.8% higher in '59 than in '58, survey by American Management Assn. indicates. Last year, R & D averaged 0.9% of sales for 47 firms surveyed.

Production of six important vegetables for commercial processing will be down 5% this year, but 13% above a 10-yr. average, Crop Reporting Board forecasts. Increases expected are: Snap beans 7%; cabbage for kraut, 1%; sweet corn, 22%; spinach, 45%. Decreases are: Green peas, 5%; tomatoes 15%. Latter outweigh increases.

Fall pig crop will be only 5% greater than in '58, and 4% fewer pigs will be produced in first half of '60 spring season than year earlier.

Number of cattle on farms is increasing about 5 million this year in cyclical upswing expected to reach 115 million by '64.

Canned asparagus pack is down 6% to 7.07 million cases, NCA reports.

Production of frozen asparagus is up 33% over '58 to 32.6 million lb., but short of record 37.7 million lb. in '56, NAFFP reports.

Spring pack of frozen spinach is 56% over last year's, or 94.6 million lb.

Pack of frozen orange concentrate set record of more than 80 million gal., USDA reports. Florida pack was up 40% to 79.9 million gal.; inventory is 33 million gal., up 70%.

Citrus production is coming back in Texas, amounting to 6.5 million boxes this year, with nearly twice that volume indicated for next season.

Eggs solids production increased 127% in first half of '59 to 31.8 million lb.

See Developments to Watch p. 13

Catch of fish and shellfish in US is up 17% to more than 2 billion lb. for first 7 months of '59. Menhaden catch is 437 million lb. higher. Alaska salmon dropped 50% to 122 million lb.

Record supplies of edible fats, oils, and oilseeds are indicated for '59-'60 marketing year. Gain is put at 10% over last year's record 13 billion lb. Stocks of food fats likely will be 30% higher this fall.

Cranberry crop of 1.26 million bbl., 8% above 10-yr. average, is USDA forecast.

Good bread? You bet!

Science for the World's Well-Being

Pfizer

Quality Ingredients for the Food Industry for Over a Century

Chas. Pfizer & Co., Inc.
Chemical Sales Division
630 Flushing Ave., Brooklyn 6, N.Y.
Branch Offices: Clifton, N. J.; Chicago, Ill.; San Francisco, Calif.; Vernon, Calif.; Atlanta, Ga.; Dallas, Tex.; Montreal, Canada

and with

PFIZER L-LYSINE

it's the most nourishing bread in history

● More and more, today's nutrition-minded housewife is looking for *high quality* protein in the bread she buys. Now with Pfizer L-Lysine, the super protein factor, you can offer a product that meets her high quality protein requirements... a product with more powerful promotional opportunities than you have ever had before. When you add Pfizer L-Lysine to your specialty nutritional bread, the protein value of that bread is raised to a level closely approximating high quality animal protein. In addition, adding the pure amino acid Pfizer L-Lysine, does not affect the taste and texture of your bread, as may be the case with other types of protein supplements.

Your specialty nutrition loaf, when protein-balanced by the addition of Pfizer L-Lysine has these important advantages:

1. It is a self-sufficient source of protein.
2. The protein has double the muscle tissue building power of the protein in breads not balanced with L-Lysine.
3. Three and one-half slices of protein bread fortified with L-Lysine are equal in protein value to a whole egg.
4. It helps build healthier appetites for children.

Capitalize on this important "Family health bonus"—it means increased nutritional value to today's health-conscious homemaker...and more sales to you.

Schedule of Events

October

15-16—Quartermaster Assn., annual convention; Statler-Hilton Hotel, N.Y.C.
15-17—National Pretzel Bakers Inst., annual meeting; Shelburne Hotel, Atlantic City, N. J.
17-21—American Bakers Assn., Sherman Hotel, Chicago.
18-20—Brewers' Assn. of America, annual convention & exhibit; Edgewater Beach Hotel, Chicago.
18-21—National Assn. of Food Chains; Sheraton Park & Shoreham Hotels, Wash., D. C.
25-28—National Frozen Food Distributors Assn., merchandising exposition; Hotel Sherman, Chicago.
29-30—National Pickle Packers Assn., annual meeting; Drake Hotel, Chicago.
31-N2—Mayonnaise & Salad Dressing Mfrs. Assn.; Palmer House, Chicago.

November

2- 5—Air-Conditioning & Refrigeration Industry, exposition; Convention Hall, Atlantic City, N. J.
16-18—Packaging Institute, annual forum; Statler-Hilton Hotel, N.Y.C.
16-19—American Bottlers of Carbonated Beverages, annual convention, Kiel Auditorium, St. Louis.
17-20—Packaging Machinery Mfrs. Inst., exposition; Coliseum, N.Y.C.
30-D4—Chemical Industries, exposition; Coliseum, N.Y.C.

HORS D'OEUVRES

► Hormel recently packed the one billionth can of Spam. And the GI's said it couldn't be done!

► Plans for supermarkets to open filling stations are disturbing. What with a prevalence of careless service-station employees, the motorist is liable to get his crankcase filled with salad oil.

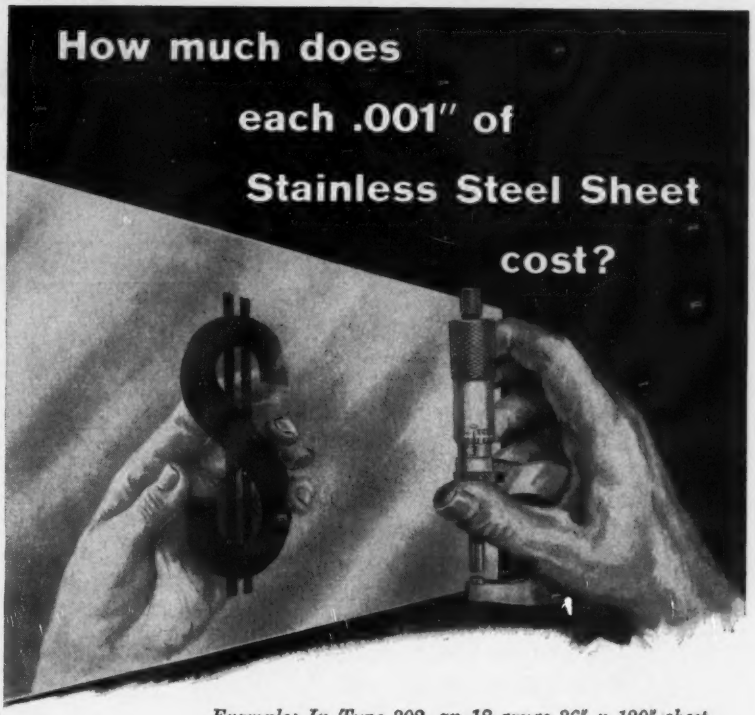
► Know what one enjoys most on a thirsty summer junket in waterless Europe? It's Coca-Cola. And you can order it in any language. You can say "beer" or "coffee" and be refreshed anywhere, too! But eventually a guy has to eat!

► How important is the California wine industry? Well, it has paid a billion dollars in taxes since prohibition ended. It has put a billion dollars into the pockets of farmers. And it has created a billion moments of pleasure.

► Japanese fishermen are worried about plans of the Soviet Union. They should be an exception?

► If you're a food manufacturer, you add value. If a processor, you preserve value. Best deal is to add a lot of value, then keep a good slice of it.

► Training program for American executives and wives going overseas has been established at American University in Washington. Idea is to get rid of the so-called Ugly American abroad. Shucks, just do as they do and you do beautifully.



Example: In Type 302, an 18 gauge 36" x 120" sheet has a base price of 52¢ per pound. In sheets of this size, each .001" of thickness weighs 1.26 pounds per sheet. Thus, each .001" of unnecessary thickness costs you at least 65.5¢ more per sheet.

On the surface this may seem insignificant, but it has a marked effect on the total price you pay for a given quantity of stainless steel sheet. With cost a factor, this can be important since stainless steel is purchased by weight.

Using the above example, a mere .001" of unnecessary thickness costs you $20.76 more per ton. If you figure the maximum allowable gauge thickness variation of plus or minus (10%), you can readily see that the price you pay for overall sheet thickness could involve much needless cost.

Washington Steel has the equipment and the experience to produce MICROROLD stainless steel to tolerances much closer than standard industry tolerances. Usually money can be saved by first selecting the minimum gauge that will serve the requirements of the application, and then specifying that the thickness be rolled to the light side of the gauge range. This specification involves no cost extra and is standard practice at Washington Steel. (If exact close tolerances must be guaranteed, there is a nominal additional charge.)

Consult your nearest MicroRold Stainless Steel Distributor. He will gladly show you how to save money on your stainless steel purchases.

Washington Steel Corporation
10-W Woodland & Griffith Avenues
Washington, Pa.

CIRCLE 9 ON READER SERVICE CARD

LOOK FIRST TO **POWELL**

Features of Construction:

Powell Corrosion Resistant Valves are made in stainless steel, Monel, nickel, Hastelloy alloys, aluminum and other special corrosion resisting metals.

Solid and double wedge discs of gate valves are interchangeable. They are precision machined and fitted and are accurately guided throughout their entire travel. This prevents drag of the disc over the seat faces, eliminating wear of seating surfaces and stops undue vibrational noises.

O.S.&Y. Valves—Stems are threaded and guided through a bronze bushing in upper yoke. (Bushings made of other alloys can be supplied on special order.) A compression lubricant fitting in upper yoke is provided to lubricate the stem and bushing threads and to reduce wear. A convenient shelf is cast on the inner sides of yoke arms for suspending the gland when renewing the packing.

All valves are regularly packed with Teflon Packing. Globe and "Y" valves are available with metal or Teflon discs.

Globe, Angle, Gate and "Y" valve stems are back seated for repacking under pressure when fully open.

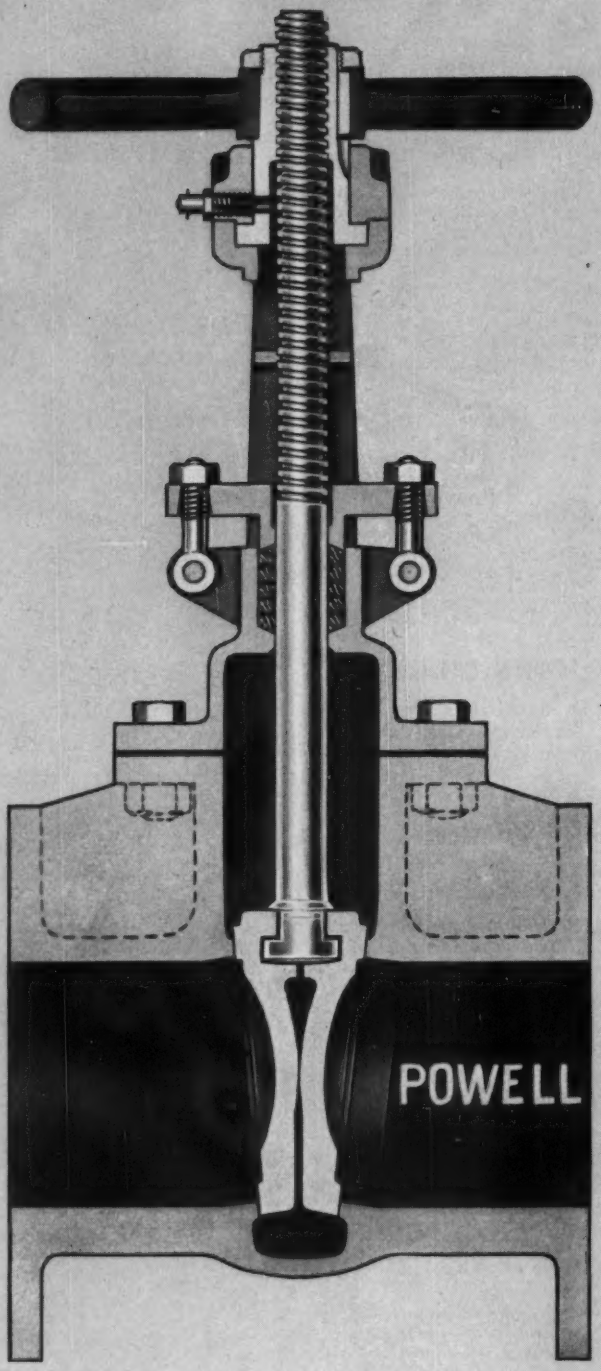


Fig. 2453 DG (Sectional)—Large Stainless Steel O.S.&Y. Gate Valve. Available with interchangeable solid or split wedges. Wedges are fully guided throughout their travel.

POWELL...world's largest family of valves

FOR CORROSION RESISTANT VALVES

Over a quarter century ago, Powell introduced the Corrosion Resistant Valve. Now, after years of pains-taking experiments and exhaustive research, Powell offers Valves to handle practically every corrosive fluid—valves of every design, and in the largest possible selection of metals and alloys.

For all your flow control requirements—water, oil, gas, air, steam, as well as corrosive fluids—Powell has the right valve in the right size and the right metal. Consult your local Powell distributor or write directly to us.

Fig. 2633—Large, Stainless Steel Swing Check Valve for 150 W.P. Sizes, 2" to 12".

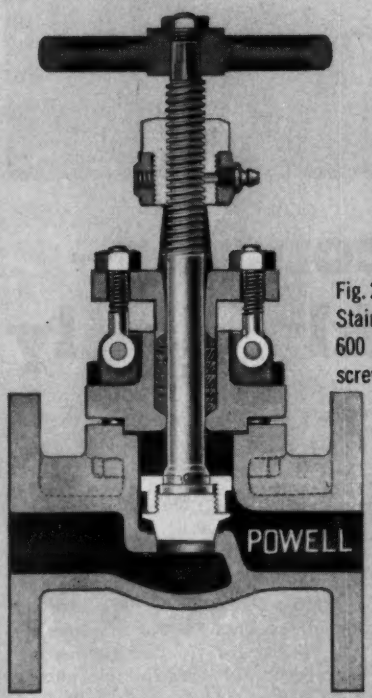


Fig. 2475 (Sectional)—150 W.P. O.S.&Y. Stainless Steel Globe Valve. 300 and 600 W.P. also available. ¼" to 3"—screwed and flanged ends.

Fig. 2106 (Sectional)—150 W.P. O.S.&Y. Stainless Steel "Y" Valve. ¼" to 3"—screwed and flanged ends. 300 W.P. valves also available.

THE WM. POWELL COMPANY • *Dependable Valves Since 1846* • **Cincinnati 22, Ohio**

No scrubbing, no scouring— belt comes clean quickly, easily

B.F.Goodrich Highseal belt lasts longer, is easy on the eyes

THE conveyor belt on this cake-icing table has to be cleaned 8 or 10 times a day. When a coated cotton belt was used here, the bakery had problems. The belt was hard to clean, water shrank it. Frequent scrubbings wore down the thin top coating on the belt, caused cracking and peeling.

Then a B.F.Goodrich distributor recommended an improved conveyor belt, developed by B.F.Goodrich for handling many kinds of food. A special rubber compound gives this belt, called Highseal, good resistance to cooking oils, animal fats, most acids, moisture —and just about everything else that ruins most belts. The B.F.Goodrich belt has no odor, no taste, never gets rancid.

Food particles can't grind into the smooth, polished surface of the belt—so there's no need to scrub or scour it. Just an easy wipe with a damp cloth and the belt is as clean as the day it was put on. It doesn't absorb moisture, so there's no waiting around for the belt to dry out.

After two years, the Highseal belt you see here still looks like new, is expected to give many more years of service. Employees who work at the icing table like the belt's light green color, find their job easier, more pleasant.

Your B.F.Goodrich distributor has full information on this belt and can tell you about its many other advantages for food-handling operations. *B.F.Goodrich Industrial Products Company, Dept. M-716, Akron 18, Ohio.*

B.F.Goodrich *industrial rubber products*

DEVELOPMENTS TO WATCH

SPECIAL FOOD ENGINEERING SERVICE to EXECUTIVES

See Who's Building What p. 17

Washington Report p. 21

Need and opportunity to retrain and relocate employees displaced by modernization will be studied under joint plan set up by Armour & Co. and labor unions. Fund of $500,000 for study will be created by company contribution of 1¢ per 100 lb. of meat processed. Unions recognize need for all-out modernization. Armour wants to protect workers.

More efficient shipping is promised by two new 85-ft. piggyback cars that are quick-loading and will haul two, three, or four trailers or containers of 40-ft., 27-ft., or 20-ft. length, respectively. These are ACF and GAT developments.

Economical transportation also gets boost from container that operates interchangeably between road, rail, and ship. Of steel or aluminum, shipper is made in 17, 20, and 24-ft. lengths. It is Fruehauf and GAT innovation.

It is feasible to prepackage red meat in packing plant if meat is sprayed with chlortetracycline solution, American Cyanamide tests indicate.

Ion exchange process will remove 94% of radioactive strontium 90 from milk.

Synthetic coffee is not far off, says Stanford Research Institute. Some 30 synthesizable coffee constituents already have been identified.

Hazard of radioactive strontium 90 in bones can be lessened by enriching food with calcium from mineral source, says Dr. L. Pauling, noted biologist.

Mellon Institute has built two new labs near Pittsburgh for research on radiation and chemical hygiene. Under Union Carbide Chemicals fellowship, hygiene lab determines toxicity of food additives and other chemicals.

Bacterium that produces elastase, enzyme which prevents deposit of cholesterol in arteries of animals, has been discovered. Mass production of enzyme by fermentation is said to be feasible.

Accelerated freeze-drying unit using Danish vacuum cabinet will be financed by Armour & Co. and installed for 1 yr. at Britain's Aberdeen lab for further development. Dryer vacuum is only 1 mm. Expanded-metal heating plates will penetrate food 1-2 mm. Jet-type condenser will be used.

Freeze-dryer will be installed by Aerated Foods to process products in England for export to Africa and South America.

Production of finished chocolate has been boosted from 1,200 to 2,000 lb. per hour by installing Morehouse stone mill ahead of finishing rolls.

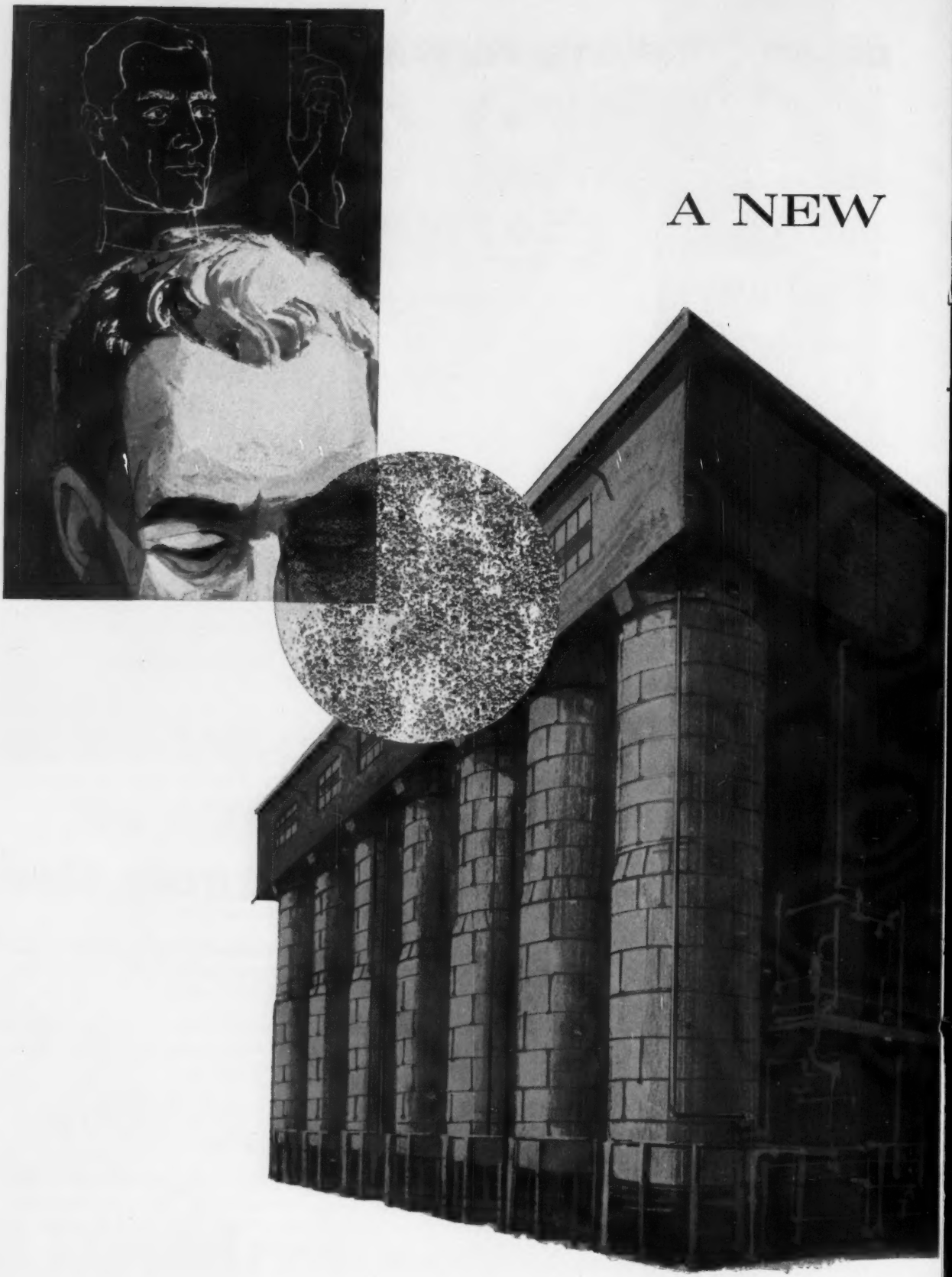
Rigid geon vinyl is used exclusively in corrosion-resistant piping system of new mustard plant built by Gulden. Pipe diameter ranges from 1 in. to 6 in. Vinyl plug valves and diaphragm valves are used.

Rigid urethane foam installation can be sprayed on flat or irregular surfaces by new system introduced by Wyandotte Chemicals and De Vilbiss. Material is applied at rate of 10 to 20 board ft. per min.

Protein is extracted from vegetable matter by shock waves set up in flow of cold water to break open cells in British process. Said to be 95% efficient, process is similar to that for extracting fat from bones.

Line of pressure-dispensing fruit-flavored drinks is planned by Nestlé, which successfully markets chocolate syrup in pressure cans. Two more large food companies may soon introduce pressure-dispensing chocolate drinks, and one is experimenting with aerosol cake frosting.

A NEW



basic source for CITRIC ACID, U.S.P.

Here is an unusually pure citric acid produced in the Midwest by Miles Chemical Company's unique deep fermentation process. Ready for immediate shipment in truck-load quantities.

For years Miles has produced a considerable volume of citric acid mainly for its own use in pharmaceuticals. A unique deep fermentation process, pioneered by Miles, yields a product remarkably free from contamination and meets Miles' most strict purity and mesh specifications.

This deep fermentation capacity has been expanded to provide a reliable, large volume supply of citric acid U.S.P. for the open market. It's ready for shipment when and where you need it. Our plant is centrally located . . . a convenient producing point with excellent transportation routes in all directions.

Write for full details. A Miles Chemical representative will be happy to discuss your requirements at your request.

Miles Chemical Company

division of Miles Laboratories, Inc.
Elkhart, Indiana
Telephone JAckson 3-1130

CIRCLE 15 ON READER SERVICE CARD 15

Aluminum Foil Packaging Plastic Film Laminations

Report No. 23 of a Series by Reynolds Metals Co.

The important functional properties of aluminum foil for packaging can obviously be supplemented by combining aluminum foil with other materials. Previous reports in this series have discussed many combinations.

The Broadest Field

The broadest field for such expansion of packaging properties is the combination of plastic films and coatings with aluminum foil. Various plastics can add heat sealability, improved flexibility, scuff resistance and greater overall durability to the protective qualities inherent in the foil alone. In fact, combinations of foil with plastic films have produced a whole new family of materials — making possible flexible packages, and also unit packages, for products which formerly could use nothing except conventional rigid containers.

Adhesive Laminating

In early developments, these combinations were achieved by adhesive laminating. This type of process is too expensive for many packaging applications even when the laminate is a simple two-layer combination. As laboratory exploration advanced into more complex structures, the cost increased — limiting the application of some materials to products requiring very special protection. During this time, and pending a solution to the economics of the problem, valuable research data was accumulated in complex laminates having many properties. These were sometimes difficult to trace to particular components, where several contributed in varying degree. But basic categories were established.

For example, combinations of polyester films with aluminum foil provide materials with exceptional strength. Reverse-printed cellulose acetate or cellophane films laminated to foil provides materials with high gloss and aesthetic properties. Saran and pliofilm in combinations with aluminum foil contribute properties of gas impermeability.

The economics of combination plastic-foil packaging was revolutionized by the development of extrusion coating. This high speed process extrudes suitable resins and polyolefins under pressure and heat directly upon the aluminum foil — to serve either as a final coating or layer of the structure, or to act as an adhesive for a further layer. Cost is much reduced, as compared to regular laminating. Therefore, this type of protection becomes available to a wide and steadily increasing variety of products.

Pilot Plant Operation

Recognizing the vast possibilities, the Reynolds Metals Company pioneered in this field. The Pilot Plant of Reynolds Research and Development Laboratory is equipped with the most modern plastic extrusion machinery — including a web carrying unit having turret unwinds, turret rewinds, an extra large cooling drum, slitting knives, and a secondary unwind to permit laminating two webs with the extruded plastic. This plant manufactures samples and evaluates all materials under carefully controlled laboratory conditions, maintaining careful records. Only by such control can the right selection for a packaging application be made and duplication of the material on the production line be assured.

Besides its Pilot Plant operation, the Reynolds Metals Company also has production extruders strategically located across the country, to supply packaging material needs after evaluation and selection.

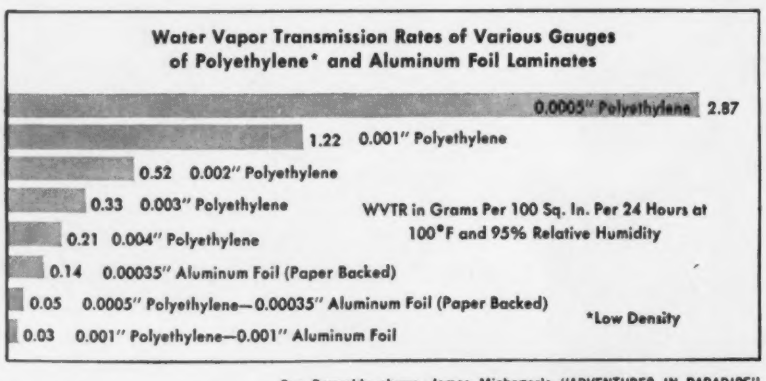
Thorough Materials Evaluation

The Pilot Plant, with its complete equipment, makes possible the thorough evaluation of all materials, including the variations in performance characteristics achieved by variations in the components. For instance, the plastic resin most frequently utilized for extrusion coating to date is polyethylene. It has the unusual properties of heat sealability at relatively low temperature, low Water Vapor Transmission Rate and chemical resistance, coupled with ease of processing. But variations in the polyethylene specification can produce a wide variety of characteristics, which must be thoroughly evaluated so that choices for particular end uses can be based on actual test data.

The accompanying chart shows how effectively even the lightest gauges of aluminum foil together with an extremely light coating of polyethylene will achieve Water Vapor Transmission Rates greatly superior to much heavier gauges of polyethylene film by itself. In addition, economies can be effected by the combination.

For Further Information

Many plastic and aluminum foil combinations originally custom made by Reynolds for particular products are now on the market. One of them may well suit your needs. Or adaptations can be developed and thoroughly tested in the Pilot Plant. For further information on this or any phase of aluminum foil packaging, call the nearest Reynolds sales office. Or write to **Reynolds Metals Company,** Richmond 18, Virginia.


Water Vapor Transmission Rates of Various Gauges of Polyethylene* and Aluminum Foil Laminates
0.0005" Polyethylene 2.87
1.22 0.001" Polyethylene
0.52 0.002" Polyethylene
0.33 0.003" Polyethylene
0.21 0.004" Polyethylene
WVTR in Grams Per 100 Sq. In. Per 24 Hours at 100°F and 95% Relative Humidity
0.14 0.00035" Aluminum Foil (Paper Backed)
0.05 0.0005" Polyethylene—0.00035" Aluminum Foil (Paper Backed)
0.03 0.001" Polyethylene—0.001" Aluminum Foil
*Low Density

© 1959 by Reynolds Metals Company

See Reynolds shows—James Michener's "ADVENTURES IN PARADISE" Monday nights and "ALL STAR GOLF" every Saturday ABC-TV Network.

WHO'S BUILDING WHAT...

Monthly Report: Food firms to spend $18,172,285 for expansion.

Proposed Work

Allstate Packing Co., Houston, Tex., meat packing plant expansion. Cost: $150,000.

Continental Grain Co., Toledo, grain elevator. Cost: $4,800,000.

Farmers Cooperative Dairy, Winston-Salem, N. C., milk processing plant to cost $400,000.

J. A. Folger & Co., San Francisco, instant coffee plant. Cost: $2,000,000.

Fred Mushroom Products, Lebanon, O., factory expansion to cost $150,000.

General Foods Corp., Evansville, Ind., $400,000 warehouse.

Nelson Dairies, Inc., plant addition to cost $125,000.

Ralston Purina Co., Ltd., $900,000 plant and office.

Contracts Awarded

Borden Food Co., Grafton, N. D., potato storage facility to cost $300,000.

Continental Grain Co., Savage, Minn., $5,000,000 grain elevator.

Farmers Cooperative Assn., Amarillo, Tex., $190,000 grain storage elevator.

Chris Hoerr & Son, East Peoria, Ill., warehouse and coffee roaster plant to cost $1,000,000.

Simco Meat Provision Co., Chicago, packing plant to cost $140,000.

Southeastern Hatcheries, Forest, Miss., poultry processing plant.

Spencer Packing Co., Spencer, Iowa, plant addition to cost $341,635.

Superior Meat Co., Los Angeles, processing plant. Cost: $125,650.

Others

Pillsbury Co. will spend over $2,000,000 to build a flour mill in Maracaibo, Venezuela, its first capital investment outside North America.

Seabrook Blanching Corp. will build a $150,000 peanut processing plant in Edenton, N. C.

Welcome to the "university" of Chemical Progress

a 5-day "curriculum" valuable to you and your job

At the 27th Exposition of Chemical Industries you can see and learn more about newest developments in your industry than is available through any other channel.

Under one roof you'll find over 500 exhibits—ways to cut costs, increase production, step up plant efficiency and improve your own products. There will be displays of plant and process equipment, instruments and controls, material handling and packaging equipment, new and improved materials, *plus* special sections for chemicals and laboratory equipment and supplies. Compare, judge new developments in your fields of interest.

Whether your responsibility is management, design, production or research you will be fortified with new ideas and better prepared to cope with tomorrow's problems. A visit to the Exposition will be one of the most profitable investments you have ever made.

Set these dates aside now—and bring your key associates.

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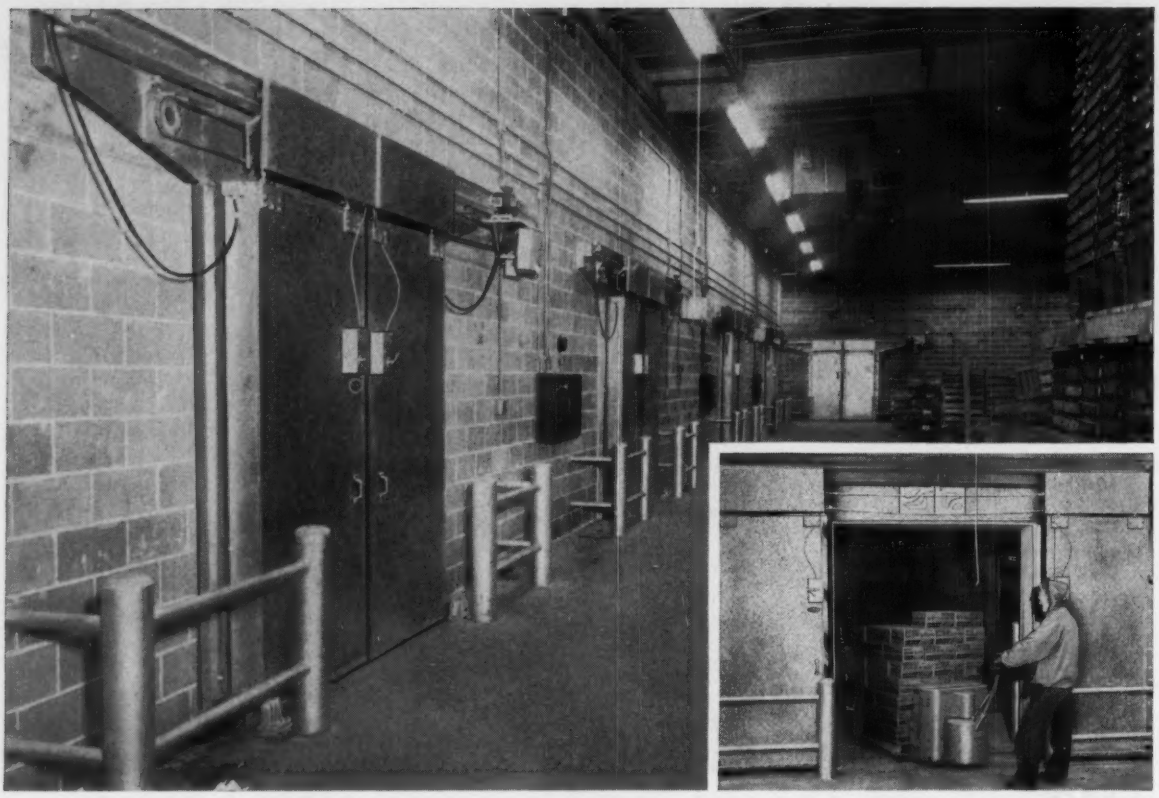
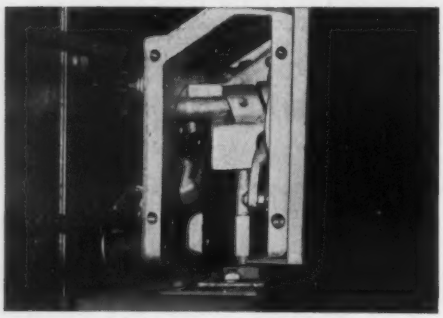
27th EXPOSITION OF CHEMICAL INDUSTRIES

N. Y. COLISEUM · NOV. 30—DEC. 4.

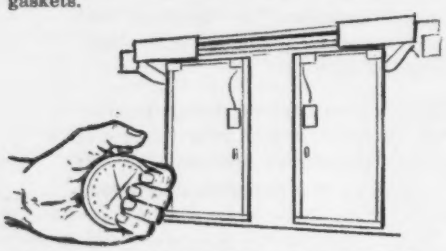
Management: International Exposition Co., 480 Lexington Ave., New York 17, N. Y



9 Jamison **Electroglide**® Doors handle heavy traffic—save refrigeration



COMPRESSION SEAL—refrigeration savings assured by cam lock—in and down action on gaskets.



SMOOTH, SHOCK-FREE OPERATION—exclusive Electroglide spring cushion chain link absorbs inertia on opening, absorbs momentum when stopping.

Insulator: Mid Continent Industrial Insulation Co., Kansas City, Kansas.

Contractor: A. W. Soderberg Construction Co., Wichita, Kansas.

• In Wichita, Kansas, at the big Safeway Cold Storage Warehouse, nine Jamison Electroglide Power Operated Cold Storage Doors demonstrate how they permit high volume, high speed warehouse operation.

Exclusive Jamison features of the Electroglide assure fast, positive operation with safety to personnel.

LEVEL RIDE—opening and closing without gasket wear or drag.

RANGE OF TYPES—available bi-parting and single leaf left or right hand operation.

PADLOCK WITH SAFETY—emergency inside release.

MANUAL OPERATION—possible when power is off.

For Electroglide bulletin—Write Jamison Cold Storage Door Co., Hagerstown, Md.

JAMISON

COLD STORAGE DOORS

CIRCLE 19 ON READER SERVICE CARD→

Photo courtesy of Cities Service Oil Company (Delaware)

Now! Buy <u>one</u> truck . . . do the job of <u>two</u>!

The *Clarklift* fork trucks pictured above are demonstrating a new *dual* function. They stack 30% higher than equipment of similar, retracted mast height . . . can *also* drive through low boxcar doors and other tight clearances. Actually, it means you're getting two machines in one.

Utilizing Clark's new *Triple* Stage Upright, you are able to take better advantage of the *full* height of your warehouse . . . yet, use the *same* fork truck for loading rail cars or highway trucks, low-door elevators, etc. The Triple Stage Upright enables your equipment to *work full time*, and on many *varied jobs* with no stacking height loss, no clearance problems, *no work stoppages*.

A specification sheet showing complete details is available on request. Simply write: Triple Stage Upright, Clark Equipment Company, Battle Creek, Michigan.

CLARK® EQUIPMENT

CLARKLIFT is a trademark of Clark Equipment Company

inted in U. S. A.

DUAL HTST PASTEURIZATION UNDER TAYLOR CONTROL

Both Milk and Ice Cream Mix are pasteurized with one dual-purpose APV unit at East End Creamery, Grand Rapids, Michigan.

The same frame, holding tube and flow diversion valve are used for both operations. Separate thermal limit recorder controllers are required, since different time-temperature relationships are necessary to meet pasteurization standards for the two products. Milk is processed at 170°F., while the ice cream mix is heated to an ultra-high temperature of 240°F. A two-speed timing pump is interlocked with these controllers to provide correct time-temperature relationship. (*Ice Cream Mix Controller is located at top left of the panel.*)

All APV equipment is arranged for Cleaned-In-Place operation. A Taylor FLEX-O-TIMER* Timed Program Controller regulates the sequence of operations in the cleaning cycle. (*Instrument at lower left of panel.*)

The two instruments in the double case at top right of the panel, plus a Flow Diversion Valve, comprise the famous Taylor Packaged HTST Control System for fluid milk. The operator simply sets the pointer to the desired temperature and East End Creamery is assured of complete protection . . . automatically.

• • •

Whether you need a 'standard' control system, or one specially designed for you, Taylor's years of experience in working with the dairy industry are at your disposal. Ask your Dairy Equipment Supplier, or write for **Catalog 500A.** Taylor Instrument Companies, Rochester, N.Y., and Toronto, Ont.

*Reg. U.S. Pat. Off.

Taylor Instruments **MEAN ACCURACY FIRST**

No Let-Up on Food Probes

Committee and commission storm clouds keep building up over food interests, particularly the chains.

► **Just reopened is the House Small Business Subcommittee's check on distribution problems–this time a series of hearings in San Francisco, Denver, Los Angeles, and Washington, D. C.**

Specially eyed by Rep. Roosevelt's team are charges that big food distributing firms force canners to sell at discriminatory prices, often under cost.

To be heard first are buying officials of large retail chains and wholesalers. Company records showing chain and canner negotiations have been subpoenaed.

► **Being sped is the draft of FTC's final report on its long economic concentration probe. The Senate's Small Business Subcommittee is pushing here.**

►**Meanwhile, FTC is probing more than a score of food-firm cases involving possible Robinson-Patman violations relative to sellers granting customers discriminatory advertising allowances.**

Such allowances have been pocketed without being used for advertising, says FTC Chairman Kintner, thus in effect being merchandise discounts. He'll stump for voluntary cleanups, with a hanging threat of prosecution.

Upshot on Color, State-Tax, Stamp Bills

Fate of several measures (see recap on bills, FE Sept., p.21) wasn't known until the last hour of Congress.

The key FDA color bill finally passed the Senate–but got no further, so must await the next session.

Through to Presidential signature went the bill versus state taxation of sales of out-of-state firms. Here, "checkup" hearings are slated next year by the House Judiciary Committee.

A food-stamp plan for distribution of surpluses also went through. However, USDA Secretary Benson isn't expected to actuate the program.

Upped Budget Boosts FDA Action

Operating on its bolstered fiscal-'60 budget of $13.8 million, FDA is accelerating activities.

The new working fund is $2 million more than was requested in the President's budget and nearly $3 million over the '59 figure.

Targeted this fiscal year is a field-staff increase to 1,062, as against the 853 of '59. Here, the aim is an inspector roster totaling 501, an up of 107 over last year.

Number of plants inspected over the year is seen stepped up from 21,840 to 27,000. And sample tests are expected to be boosted from 29,750 to 33,000.

Battle Lost: Express Rates Go Up

To ICC went a tariff filing by Railway Express Agency to raise express rates on less-than-carload lots. Specified were (1) a 35¢-a-cwt. up (minimum 35¢ per shipment) between Eastern points and between Mountan Pacific points, and (2) a 25¢-a-cwt. rise (25¢ minimum) between all other points–rates to become effective Sept. 1.

Much opposed, the Bureau of Commercial Fisheries petitioned ICC to suspend these filed schedules and investigate their lawfulness. It cited hardship to fishing interests. And it pointed out that the jump bore too heavily on low-rate shipments.

Among 13 other petitioners against it were USDA, National Fisheries Institute, California Grape & Tree Fruit League, International Apple Assn., and Texas Citrus & Vegetable Growers & Shippers.

But the call on ICC failed. September came–and the boost was on the books.

Scout International Effect of Synthetics

Development of a synthetic coffee may be just around the corner. So says a report made to the Senate Foreign Relations Committee by Stanford Research Institute.

The Committeemen's concern is over the possible harmful effects on US-Latin American relations.

Thirty constituents of coffee have been chemically identified. And the same research processes can be ranged on cocoa and tea. What's more, a cost breakthrough may be possible on synthetic sugar (up to now more expensive to make than the natural).

USDA 'Angels' Italian Food Research

New development is grant by USDA of some $94,000 to an Italian institution for research on canned beef (changes occurring during processing) and canned peach and apricot purees (effects of temperature changes during distribution of products).

Recipient: The Experiment Station for the Food-Preserving Industries, Parma.

Payments for such overseas programs are being covered out of foreign currencies accruing to the US abroad for sale of agricultural commodities under Public Law 480.

BRIEFS

First '59 boost in the domestic sugar quota–from 9.2 to 9.3 million tons–is announced by USDA. Increased industrial use is cited.

Government aid to float an advanced fishing fleet is favored by Sen. Magnuson (D., Wash.). He warns of competitive menace of Soviet's modern deep-freeze equipped trawlers. Russia now has 30 topnotch ships, plans 120 more within 7 yr.

As for who'll haul those 'big pillow' freight bags (FE July, p.17), watch for hot arguments in this month's ICC hearings. Forty-one common carriers have petitioned to tote the tubes. But their getting in on it is strongly opposed by tank-truck and tank-car interests.

Squeeze-bottle foods will be Okay for sustaining our first globe-circling astronaut. So says an Air Force nutrition study. "Monotonous, yes–but adequate" was candid reaction of the 15 men who recently test-ate these specialized tubed victuals for 5 days.

Pact to control coffee exports from grower countries–aimed to smooth the fouled supply and price picture–was signed in Washington by 15 Latin American nations and France and Portugal. Encompassed is some 85% of beans going to world markets.

Myverol® Distilled Monoglycerides

	Type 18-00	Type 18-07	Type 18-40	Type 18-85
Source material	Fully hydrogenated lard	Fully hydrogenated cottonseed oil	Prime steam lard	Refined cottonseed oil
Monoester content (min.)	90.0%	90.0%	90.0%	90.0%
Saponification value	155-165	155-165	160-165	150-160
Iodine value	1	1.0 (max.)	45 (approx.)	80-90
Glycerol content (max.)	1.0%	1.0%	1.0%	1.0%
F.F.A. (max.): as stearic / as oleic	1.5%	1.0%	1.5%	1.5%
Specific gravity	0.96 at 75°C	0.94 at 75°C	0.96 at 60°C	0.96 at 60°C
Congeal point (approx.)	68°C	67°C	54°C	46°C
Clear point (approx.)	73°C	76°C	60°C	56°C
Form	Bead	Bead	Plastic homogenized fat	Plastic homogenized fat
Net shipping weight, lb.	250	250	400	400

For the engineering of food texture

Here are four fats for foods, typical of the broad variety of distilled monoglycerides you can get from DPi. Their high monoester content, the result of a unique segregation of fat molecules in the vapor phase, makes possible precise engineering control over the physical structure of foods which contain fats.

High mono content makes these emulsifiers more efficient, hence less expensive, than mixtures of mono- and diglycerides. Emulsions are easier to form and less emulsifier need be used.

Myverol Distilled Monoglycerides are bland, stable, and free from catalysts and soaps. There is nothing in them that might affect taste, color, or odor. To learn which of them might improve your control of food texture, write ***Distillation Products Industries,*** Rochester 3, N. Y. Sales offices: New York and Chicago • W. M. Gillies, Inc., West Coast • Charles Albert Smith Limited, Montreal and Toronto.

distillers of monoglycerides made from natural fats and oils

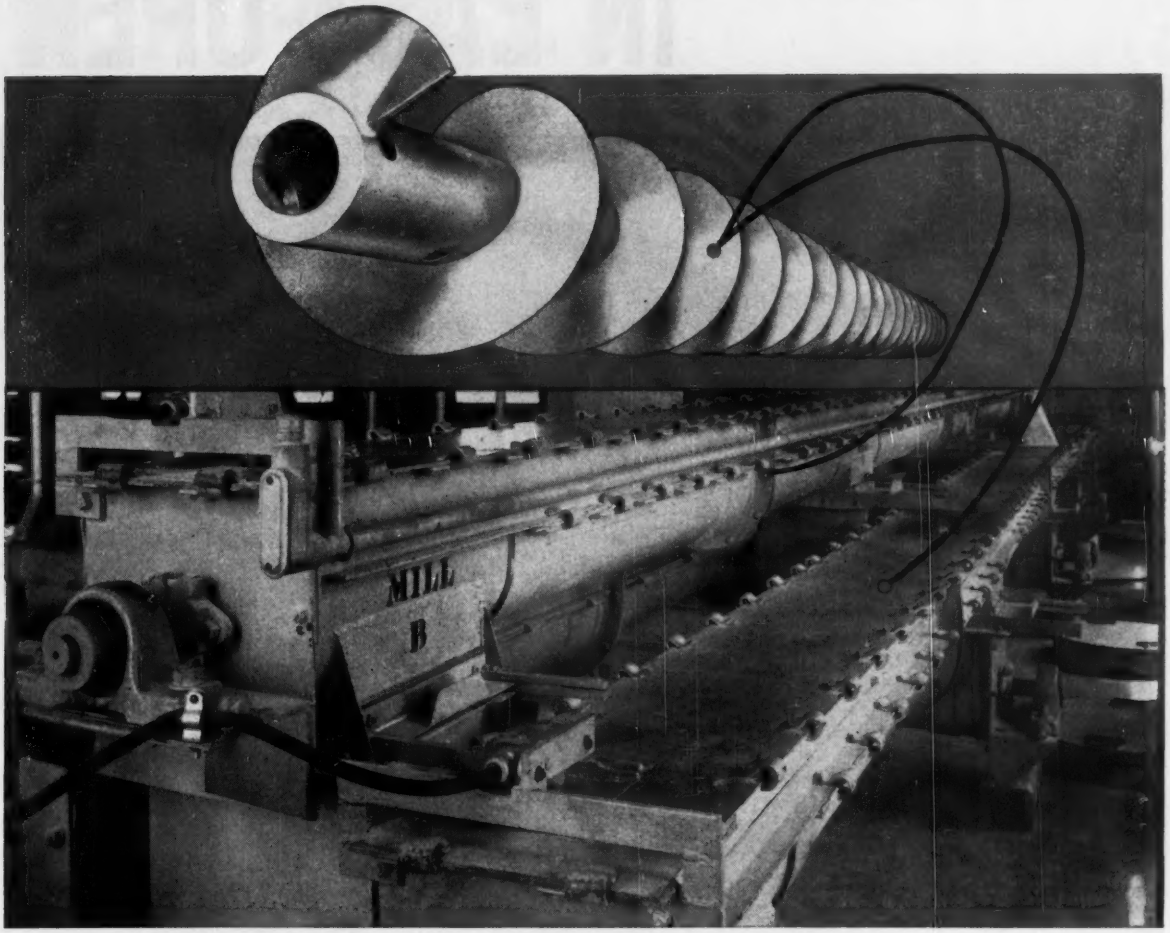
DPi

Also . . . vitamin A in bulk for foods and pharmaceuticals

Distillation Products Industries *is a division of* **Eastman Kodak Company**

Why a system of LINK-BELT screw conveyors

FITS LIKE A GLOVE AND WORKS LIKE A CHARM



- **Thorough engineering analysis of all conditions**
- **Full responsibility for satisfactory performance**
- **Unbiased selection from industry's most complete range of components**
- **Expert field erection**

With Link-Belt, screw conveyor engineering includes far more than just supplying a suitable product. All related aspects of your production are considered—including prior and subsequent handling, plus integration with other equipment. And because Link-Belt handles all details from specification to erection, it means a better-working system with less work for you.

Continuous product improvement and development by Link-Belt has produced industry's widest range of components for screw conveyor applications—various types of flighting, gates, troughs, drives . . . plus a new line of ball and roller bearing equipped accessories.

Link-Belt specialists will work with you to determine the feasibility of adapting screw conveyors to your operation. Call or write your nearest Link-Belt office for full details. Ask for Book 2989.

LINK-BELT

SCREW CONVEYORS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World. 18,234

NASHUA ANNOUNCES IN EASY-OPEN

MAJOR BREAK-THROUGH BOX TAPES...

New Peelac* Peelable Tape makes possible a truly easy-opening carton.

Here's BIG news for shippers!
It's Nashua's new Peelac Peelable Tape... a tape that lets you package in an easy-opening carton...

Here's the story...

You cut down product spoilage! No knives or other sharp openers needed. An easy pull...and Peelac strips off clean. Fast, easy opening...no damage to contents.

You get economy! New Peelac obsoletes costly, clay-filled fabric peel-tapes, pull-tab inserts, similar opening devices.

You get modern design flexibility! New Peelac Tape permits a wide variety of different designs for your cartons—obsoletes costly, clumsy carton opening devices.

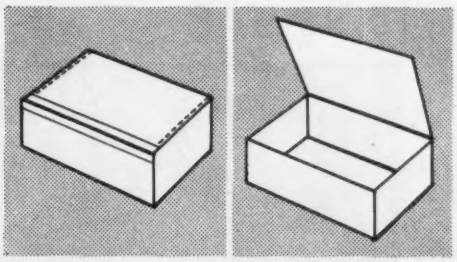
You get better display at point of sale! New Peelac-taped cartons lend themselves to "as-is" display...tray-type shelf display ...easy price stamping.

New Nashua Peelac Peelable Tape is ready to go to work for *you* right now! Call in your box maker. Or use the coupon for prompt, complete information.

Act today!

**Trade-mark*

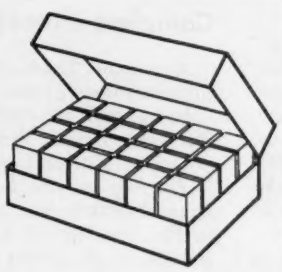
NASHUA Corporation



"Up-top" manufacturers joint, another easy-open closure made possible by Peelac, provides lid-like opening for cartons. Versatile Peelac Tape meets wide variety of packaging and product needs... modernizes your shipping containers!

Manufacturers joint formed "up front" with new Nashua Peelac Peelable Tape!

The carton opens like a suitcase for neat display, easy price stamping. No knife. No damaged products or package!



CLIP AND MAIL COUPON TODAY!

Nashua Corporation
Dept. FE-109
44 Franklin Street, Nashua, New Hampshire

Send full information on Peelac Peelable Tape and how it can improve my packaging.

NAME_____ TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

NEW PACKAGES & PRODUCTS

Second Launching for Salad Mixes

A comprehensive marketing program involving a redesigned package, new flavors, and a new advertising approach is re-launching General Foods' Good Seasons salad dressing.

The new program stresses the disinctive qualities of mixes and their versatility, as well as product identity.

New packages are white with an appetizing full-color illustration of a prepared salad. A 2-tone green leaf motif is the background for the white Good Seasons logotype.

In addition to new Italian and Cheese-Garlic mixes, Classic and Garlic have been re-blended.

"Breathing" Film for Produce

Plax Corp. is now offering produce packagers an oriented polystyrene film that "breathes." Known as Polyflex, the material is 1 mil in thickness and allows a limited passage of moisture to and from produce.

This "breathing" action prevents fogging and also allows carbon dioxide to escape. Thus the wrap need not be perforated. The supplier reports that Polyflex is unaffected by water and retains its crispness.

Plax also reports that the film costs 20-40% less than conventional films. It may be heat-sealed or printed by rotogravure, flexography, silk-screen, or letterpress.

Circle 402 on Reader Service Card

"True Ale" for Westerners

After more than a year of research and analysis, Lucky Lager has introduced its "Lucky Bankers Ale" in the western U.S.

A specially-constructed San Francisco ale house is using "top fermenting" yeast to produce the "true ale".

Use of the familiar Lucky Lager "X" motif on the packages for the new ale strengthens family identification. Designs are by Walter Landor & Assoc.

Product will be sold in 12-oz and 1-qt bottles, as well as regular and king-sized cans.

Circle 403 on Reader Service Card

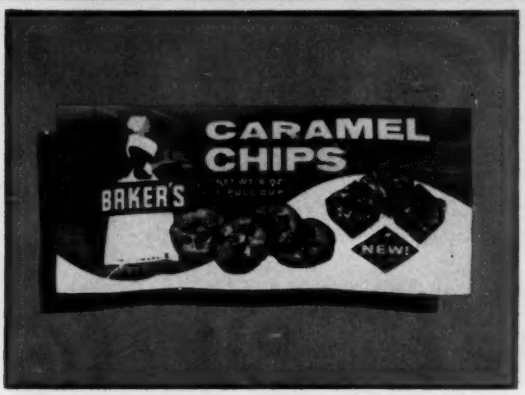
Complete Line of Throw-Aways

A complete line of throw-away bottles are now offered to the carbonated beverage industry by Owens-Illinois.

In line with the continuing trend toward convenience for the consumer, the bottles are designed to require minimum changes in bottling plant equipment.

Ranging in size from 10- to 32-oz., bottles have stippled surfaces, and blown in lettering to call attention to the "no deposit" feature. Availible in all standard glass colors, the bottles are reported to weigh less and cost less then other models of "no return" bottles.

Circle 404 on Reader Service Card



Redesign Adds "Family Look"

Redesigned packages for the Baker "chip" line now feature strong family identification and appeal for impulse buyers.

The family image has been strengthened through a new continuous curve design, an enlarged "La Belle Choclatiere", and a clear window for product display. The window also helps Baker compete with other brands which offer a smaller size chip at a lower price.

The new design is used on both 6- and 12-oz. packages for chocolate, caramel, and lemon chips.

New designs are by Eron and Eron, Inc., Englewood, N. J.

Circle 405 on Reader Service Card

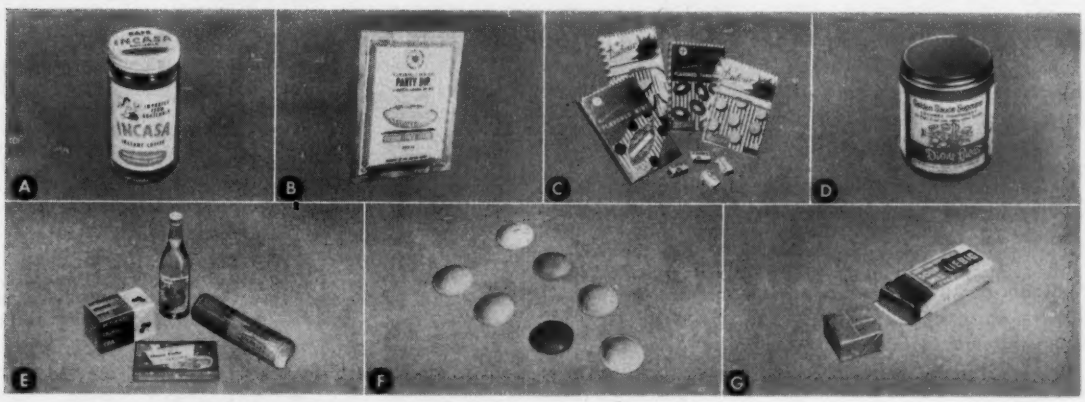
Vinegar Samples–in Bags!

Handy cellophane-polyethylene pouches are the novel packages for free samples of Regina wine vinegar distributed in the U.S. and Canada.

Ellene Bros. winery has reported a "substantial sales increase" as a result of the give-away program. Enough vinegar to fill 12 tank cars has already been distributed in supermarket produce departments and through "tie-in" promotions.

The Durafilm pouch is made by Dobeckmun Co. and is ideally suited to hold the government regulated acetic acid content of the highly-flavored vinegar.

Circle 406 on Reader Service Card



International Food Display

"A four-day market place"—that's how visitors described the fifth annual National Fancy Food and Confection Show held in New York City recently. More than 20,000 buyers flocked to the exhibits of 5,000 different foods from all over the globe.

Here are a few highlights of the show:

A) Pure Guatemalan instant coffee boasts less oil, less bitterness. Packed by Incasa, the 2- and 6-oz. sizes are for institutional use.

B) Party dip is newest addition to the General Foods gourmet line. Flavors: toasted onion, cheddar, blue.

C) French "chips" by Dufour have liquid centers. Flavors are tamarind, lemon, orange, and mint.

D) Golden Sauce Supreme is a recipe of television chef Dione Lucas. Ingredients include butter and sherry.

E) Irish imports included Leprechaun light beer, Homade ginger fudge, Boland's thin arrowroot biscuits, and McGrath Irish-style tea.

F) "Moonships"—candy pellets packed in an edible wafer casing—were displayed at the Belgian Consulate booth.

G) Foil-wrapped cubes, packed 2 to a ¾-oz. carton, each make 2 servings of beef and vegetable soup.

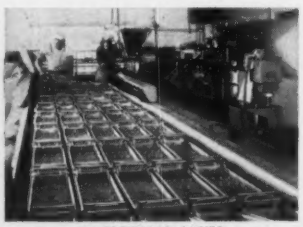
SILICONE NEWS from Dow Corning

All Product...No Foam

Dow Corning Silicone Defoamers Keep Production in High Gear

Peak season processing of beans, peas, carrots and other vegetables – pickles and fruit, too–can't wait on foam. That's why more and more food processors are using Dow Corning silicone defoamers to keep foam under control at all times.

Whether yours is vegetable processing or some other phase of the food industry, foam robs you of production space, slows processing, increases maintenance, causes boil-overs and waste — may even create fire hazards!



IN FREEZING MIXES

Stop foam before it starts. Easy to use, fast-acting Dow Corning silicone defoamers won't contaminate your products . . . are completely safe in packaging and processing. Dow Corning Antifoam A may be used in nonstandard foods at concentrations to 10 ppm; and water-dilutable Antifoam AF Emulsion at concentrations to 34 ppm.

AN EASY-TO-USE SPRAY

A generous trial sample is yours for the asking. Write for this FREE SAMPLE, indicating your foaming problem and whether your system is aqueous or oil. Address Dept. 5522 for prompt reply.

first in silicones

Dow Corning CORPORATION

MIDLAND, MICHIGAN

ATLANTA BOSTON CHICAGO CLEVELAND DALLAS LOS ANGELES NEW YORK WASHINGTON, D. C.

New Packages & Products

NEWEST CEREAL from Kellogg is "OK's", an oat cereal molded into O's and K's. Introductory ad above shows Big Otis, trademark used for the cereal.

Packaging Briefs

Iceless Icebox–a foil-laminated corrugated box–serves as multi-carrier for 6- and 24-packs of Haffenreffer beer. Supplier is Stone Container Corp. (407)

Laminated Transparent Pouch is introductory package for Lee brand smoked and ready-to-eat chipped ham. Pouch is by Continental Can Co.'s, Flexible Packaging Division. (408)

Boilable Bags used to package Fox De-Luxe entrees brought need for new low height carton (¾ in.) Carton is supplied by Marathon Div. of American Can Co. (409)

50% Boost in Shelf Life for some products is claimed by Continental Can Co. for its Flav-O-Tainer boxboard tray. (410)

Handy 29-oz. Can is now used for Del Monte juice drinks.

Circle Key Numbers on Reader Service Card

New Product Shorts

Kellogg's Concentrate now moves into national distribution after test marketing in California, Arizona, and Nevada.

National Distribution has been announced for Betty Crocker Instant Mashed Potatoes.

A Cake Mix Line has been announced by Topco Assoc.

Thousand Island Dressing has been added to Pfeiffer's Food Products' line.

Chocolate Topping called Lucky Mondae is new institutional product from Nestle.

Apple Spice Cake Mix is newest Swans Down cake mix–and the 15th.

Two New Soups for Campbell are old-fashioned tomato and rice, and cream of vegetable.

Just Between You and Your Customer

Customer confidence... key ingredient for repeat sales... requires carefully designed protective packaging that never lets the customer down.

This is Riegel's business: The research, the development, and the manufacture of highly technical packaging materials, designed first for protection...with equal stress on low cost, high packaging speed, and attractive appearance. More than 600 different Riegel materials now available...papers, foils, films and combinations...waxed, coated, plain or printed as your needs require.

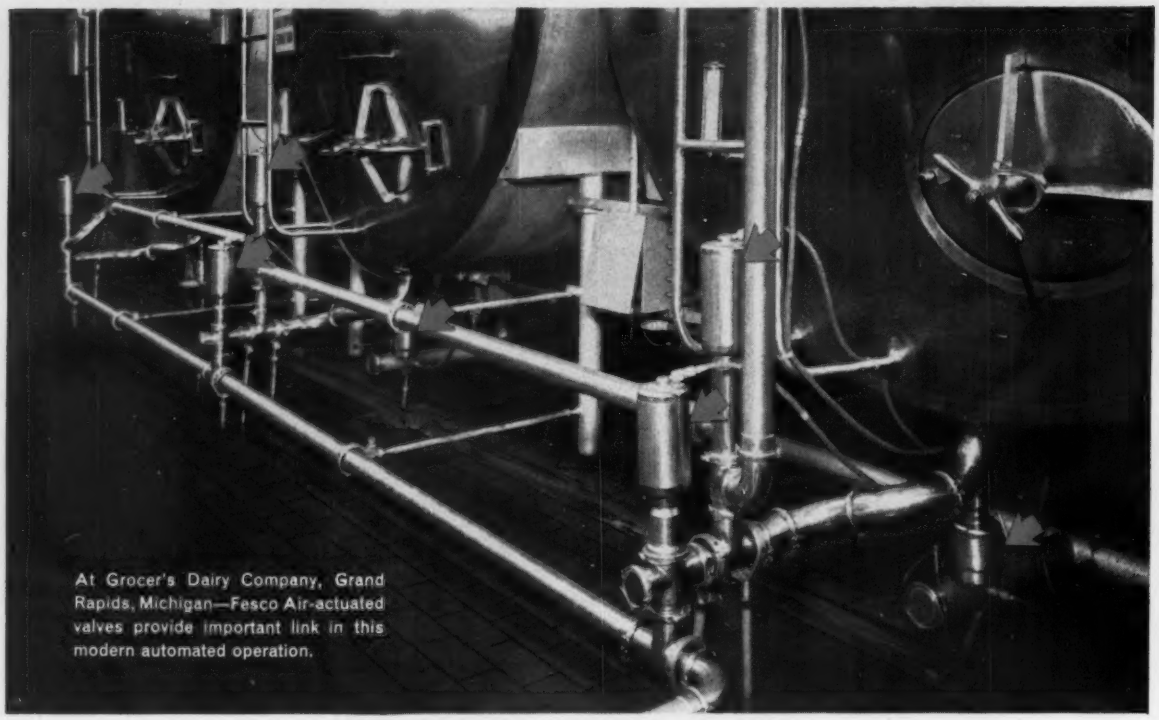
Riegel research and Riegel versatility can help your sales. Write to Riegel Paper Corporation, 260 Madison Avenue, New York 16.

Riegel

PROTECTIVE PACKAGING MATERIALS

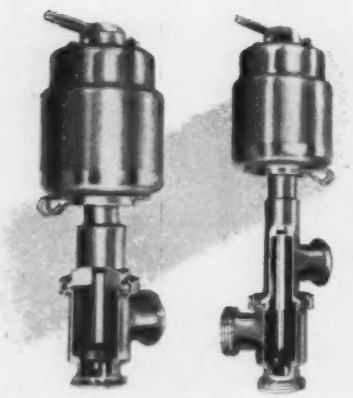
Lever Brothers Company uses Riegel Poly Pouch to vend "All" in self service laundries. Poly Pouch is made, flexographic printed, heat-seal coated by Riegel for Scientific Packaging Company.

Fesco AUTOMATIC AIR-ACTUATED VALVES



At Grocer's Dairy Company, Grand Rapids, Michigan—Fesco Air-actuated valves provide important link in this modern automated operation.

The fast action, fast cleaning choice for automation



Ask your nearest Tri-Clover Distributor about Fesco Valves, for either "C-I-P" or Processing operations. Or write Tri-Clover Division for detailed recommendations for your specific application.

Wherever you find a need for accurately controlled automation of dairy, beverage or food processing operations you will find versatile, fast action Fesco Automatic Valves.

These efficient fast acting valves, manufactured by our Fesco Division (formerly Food Equipment and Specialties Co.), are backed by many years of practical experience and specialized knowledge in automatic control of processing and cleaning lines. The valves are available in all standard sanitary sizes for actuation by remote, manual or automatic control. Automatic process control can be achieved by pressure, temperature, flow or liquid level conditions, to meet your requirements.

The dependable actuator is easily coupled to the valve body for fast take-down and reassembly. All seats and O-ring seals are constructed of material having wide acceptance in the dairy and food fields and are unaffected by food or liquid products and cleaning solutions.

With the addition of Fesco Valves, Ladish Co. continues to keep pace with the latest technological advances in the Dairy, Food, Beverage and Chemical-Process Industries.

See your nearest Tri-Clover Distributor.

F-159

IN CANADA:
Brantford, Ontario

EXPORT DEPARTMENT:
8 S. Michigan Ave., Chicago 6, USA—Cable TRICLO, Chicago

TRI-CLOVER

LADISH CO.
Tri-Clover Division
Kenosha Wisconsin

Best way to Increase Flavor, Texture and Value

Food processors have long relied upon the quality ingredients distributed to the food industry by Corn Products Sales Company: Cerelose dextrose sugar; Buffalo, Hudson River and Snowflake starches; Rex and Globe corn syrups. These fine products bolster the flavor, texture and color of fine foods—factors that enhance food value and keep buyers reaching for your brand.

The sugars, syrups and starches available from Corn Products Sales Company do more than increase these desirable food qualities: they save on production costs as well. These *natural* products are easy to handle, lead to more efficient, economical processing. Their carefully controlled quality, uniform from day-to-day, means your formulations can be consistent and standardized.

The experience amassed by our technical representatives in incorporating Corn Products sugars, syrups and starches in virtually every type of fine food product sold today, is always at your service. For full information on how these quality-enhancing ingredients can be adapted to your processing, call our nearest sales office or write direct.

CORN PRODUCTS SALES COMPANY • 17 Battery Place, New York 4, New York

Fine Products for the Food Industry: CERELOSE® dextrose sugar • BUFFALO®, HUDSON RIVER® and SNOWFLAKE® starches • REX® and GLOBE® corn syrups

What Should Packaging Machinery Really Do?

Put a product into its package? Obviously! And most any packaging machine will do that—one way or another.

But you already know just any machine won't do the packaging job you want done. "One way or another" isn't good enough, because your requirements aren't like anybody elses. At least not quite.

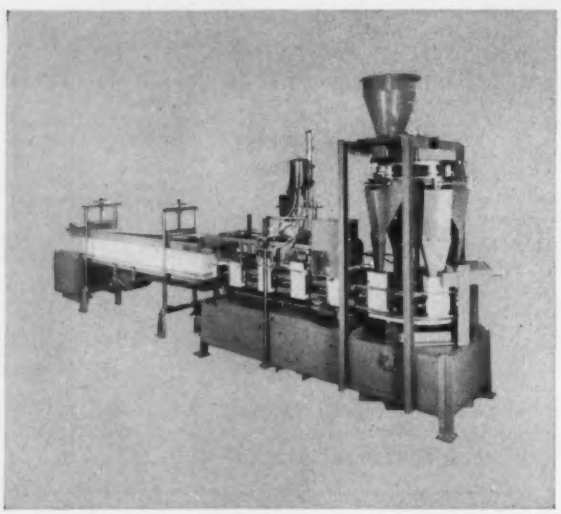
You have to be concerned with the not so obvious aspects of packaging—the unnecessary packaging cost that can make or break a competitive advantage . . . the savings here and there that add to your profit and production efficiency . . .

We're talking about packaging machine performance of course. *With it, you're in. Without it—well . . .*

HOW DO YOU MEASURE PACKAGING MACHINE *PERFORMANCE?*

It isn't always easy. Particularly when you're comparing competitive equipment before you buy. What you want to find out is how much the machine will do for you.

For example, let's take a machine that forms, fills and seals cartons. A machine that will handle anything from grass seed or dog biscuits to powdered milk. Here's the kind of performance you can measure:



The machine should be automatic. It should do as much of the packaging job as possible. By itself. Failure within the sequence of forming, measuring, filling and sealing should be automatically detected and controlled.

You really save
with the Triangle Carton Sealer
—fully automatic . . . delivers only properly filled and sealed cartons . . .
will even insert coupons or pouring spouts . . .
can be equipped with Triangle net weighing scales, volumetric filler or auger packers.

The machine should be flexible. It should handle all your carton sizes. Changeover should be as simple and fast as possible.

You really save
with the Triangle Carton Sealer—
handles carton sizes from 4″ x 1¾″ x 6½″ to 10″ x 3″ (or 8″ x 5″) x 16″ . . .
changeover throughout this range is much simpler and faster than normally expected.

The machine should be economical. If it costs too much to buy, all the refinements of automatic control aren't practical. What you want is the greatest speed and performance for the most reasonable investment.

You really save
with the Triangle Carton Sealer—
capable of delivering up to 70 cartons per minute . . .
push-button control, automatic operation
at a price equal to many machines without it (far less than you'd expect)!

What better way to measure performance! Speed, flexibility, automatic operation and all at a price that's right. Make sure you get what you need by having our experienced packaging engineers study your requirements. Their analysis, specified in detail, will provide a measure for comparison. With it you will be able to know which machine is right for you.

Incidentally, Triangle equipment compares very favorably in all cases. In many, it is outstanding. Write us in Chicago. Ask to have your local Triangle representative contact you. No obligation, of course.

35 YEARS

. . . . . YOU REALLY SAVE WITH . . . . . .

TRIANGLE
PACKAGE MACHINERY COMPANY

6637 W. Diversey • Chicago 35, Illinois
Telephone TUxedo 9-0200 F-5C52

Price To Be Paid for Technological Progress

While public attention was focused on the steel strike stalemate, a pioneering step in management-labor relations was taken in the food industry.

We refer to the agreement between Armour and labor to study needs and opportunities to do something for workers adversely affected by technological advances.

This agreement involves two basic concepts: 1. Labor agrees that modernization and automation are necessary. 2. Management recognizes that workers can suffer from labor-saving innovations, and it accepts joint responsibility with the unions for determining what can be done about it.

Departure from traditional philosophy

This represents a departure by management from the concept that mechanization and automation create more jobs than they eliminate. That concept has proved out in practice throughout industrial history. But comes the second industrial revolution, sparked by automation, and the tried-and-true concept is challenged.

The handwriting has long been on the wall of labor union offices. The new concept is forcefully expressed and "documented" in the AFL-CIO publication, "Labor Looks at Automation." In the foreword, President George Meany says that labor welcomes technological progress. Then he points to potential adverse affects. Meany concedes that unions do not know all the answers, but observes that management and government, as well as labor, want to find them.

It is not surprising, then, that an agreement should be made with Armour for a joint study plan. Top management in the packing firm is public spirited, and the meat industry has been modernizing extensively to eliminate accumulated and costly obsolescence. Armour has improved operations to the extent that some 25,000 fewer workers reportedly are required than in 1955.

The fact that so much has been done so fast made the joint study plan particularly pertinent. Where factory revamping is more gradual, as in most branches of the food industry, displaced workers often can be absorbed through normal turnover in employment.

Packer-labor plan merits close study

The fact remains, however, that food and other manufacturers will be under increasing pressure from labor to assure that effects of technological advance on employees will be minimized. So the packer-labor study plan and its future results bear close scrutiny.

Armour is financing the study by contributing 1¢ per 100 lb. of meat processed until a fund of $500,000 is created. This fund will be administered by a committee comprising four men from management, four from labor, and an impartial chairman selected by mutual agreement. This committee will use the fund to study worker problems resulting from modernization. They will make recommendations for their solution. Particular consideration will be given to retraining displaced workers for new jobs, and to the promotion of job opportunities within the company for those affected.

Information from such a study can be a valuable management tool. It can show how to keep good workers in the company—even upgrade them—though their old jobs are abolished. It can point up practices that minimize labor disturbances. And it can perhaps minimize serious future labor demands—such as that to create jobs by adopting a 30-hr. week with no reduction in take-home pay.

In short, such a study is a sound investment in the future.

carries on into the future

. . . with the help of the Ætna Life's Business Planning Department

Stanley B. Cressey owns a modern superette. He built this business to a steady year-round volume and looks to the day his son can take it over.

A representative of Ætna Life's Business Planning Department explained what can happen to such a business when its owner-manager dies. With him goes not only the value of his own experience but also the "good will" he has created — leaving more of a problem than a legacy to the heirs!

So Stan's Ætna Life representative, attorney and accountant, worked out a plan to safeguard his family's interest. It will provide money to get them over the rough spots, to maintain profits and stabilize credit until Stan Jr., can take over.

If you own or operate any kind of business, it will pay you to investigate the vital need for a business continuation plan — and no one is better equipped to serve your interests than the Business Planning Department of your local Ætna Life General Agency.

ÆTNA LIFE
INSURANCE COMPANY

Affiliates: Ætna Casualty & Surety Co. • Standard Fire Insurance Co. • Hartford, Conn.

Now! With All-New High Efficiency Regulator!

ALEMITE

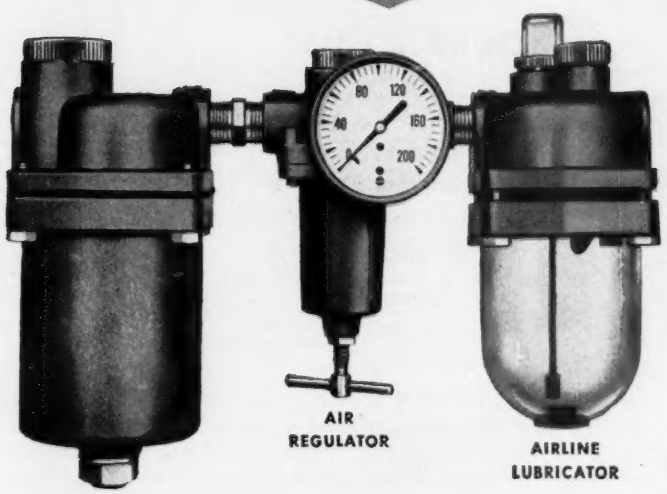
"Tri-Duty" Airline Controls

...FOR THE CLEANEST, DRIEST, BEST-REGULATED AIRLINE LUBRICATION...

Automatic Water Separator! Removes all of condensate, all the time. Traps dirt particles to prevent damage to sensitive airline devices. Handles all airline pressure up to 200 PSI and flow volume from 5 to 50 CFM.

New Air Regulator with Gauge! Assures accurately controlled air—prevents erratic operation and damage to equipment. Design permits inlet pressures of 250 PSI—adjustments up to 125 PSI. Excess air pressure "bleeds off," within regulator, instantly.

Automatic Airline Lubricator. Compensating ball valve design controls air flow. Oil particles are atomized for most efficient transmission through supply lines. Result—uniform mixture regardless of air pressure and volume. Oil and air mixture proportionately constant. Reservoir may be filled at any time, assuring continuous operation. Nine-ounce capacity.



WATER SEPARATOR

AIR REGULATOR

AIRLINE LUBRICATOR

ALL-NEW FEATURES OFFER OUTSTANDING ADVANTAGES:

- Ideal for air tools, air cylinders, air motors, etc.!
- Most efficient airline lubrication available!
- Specifically designed for extensive service life and peak efficiency under adverse operating conditions!
- Engineered to give greatest three-way protection, durability and efficiency . . . in a complete package!

Mail Coupon for Full Information!

Symbol of SW Excellence

ALEMITE DIVISION
STEWART-WARNER CORPORATION

1850 Diversey Parkway, Chicago 14, Illinois

ALEMITE, Dept. S-109
1850 Diversey Parkway, Chicago 14, Illinois
Please send me all the facts about Alemite's new "Tri-Duty" Airline Controls.

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City_____ Zone_____ State_____

How Our TELLING Helps Your SELLING

This message concerns the color chart opposite PLEASE READ THIS PAGE FIRST

Roche expands educational program for Beta CAROTENE

the safe, yellow-to-orange color that nourishes

At right is a sample of the large color chart which Roche has published for distribution to thousands of home economics teachers and their students, to dietitians and others interested in nutrition.

This colorful chart is the latest creative effort in the continuing program which Roche is using to educate educators — and through them consumers — in the values of pure, safe beta carotene.

We're telling your present and potential customers that beta carotene *in your foods* is an important ingredient . . . that it is safe . . . that is provides uniform color . . . that is has vital nutritional value because it is provitamin A. **Carotene is the *only* color that nourishes.**

Beta Carotene in your products can be a valuable sales aid. Your foods are more desirable because they are more attractive and more beneficial to health. Beta Carotene can provide the important *plus factor* in your sales story.

Beta Carotene Roche is used in many different foods to give color (ranging from pale yellow to deep orange) and nutritional value. Some of these foods are:

Margarine • Salad and Cooking Oils
Shortening • Mellorine • Ice Cream Products
Pie Crust and Cake Mixes • Baked Goods
Fruit Drinks, Fruit Juices and Concentrates
Puddings and Egg Yolk Products • Frozen Foods
Gelatin Desserts • Confections • Dessert Toppings
Popcorn • Cheese • Soups • Creamed Foods

Is your good food on this list? If it is, you will gain from the Roche educational program for beta carotene. If it's not, shouldn't it be? Find out now. Call Roche for expert advice and technical guidance.

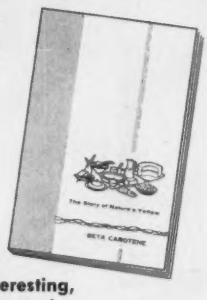
Special To Sales, Product And Advertising Managers And Package Designers

You can increase the selling power of your advertising, your sales promotion and your package labels when you actively promote

Beta CAROTENE

as one of your product ingredients. Why? Because it is the only yellow-to-orange color that nourishes.

Four-color chart 14" x 21"



Interesting, informative Brochure

Demonstration Kit

YOURS TO USE

We will gladly supply you with reasonable quantities of the colorful beta carotene chart, the demonstration kit and the educational brochure, "The Story of Nature's Yellow," if you want to use them in your own promotion.

P.S. If you're the one who removes the color chart from this magazine, just put your initials here_____so your associates will know where to look for it. Better still, why not see that all interested people in your organization have a copy of the chart. We'll be glad to send as many as you need.

VITAMINS COME RIGHT FROM

ROCHE

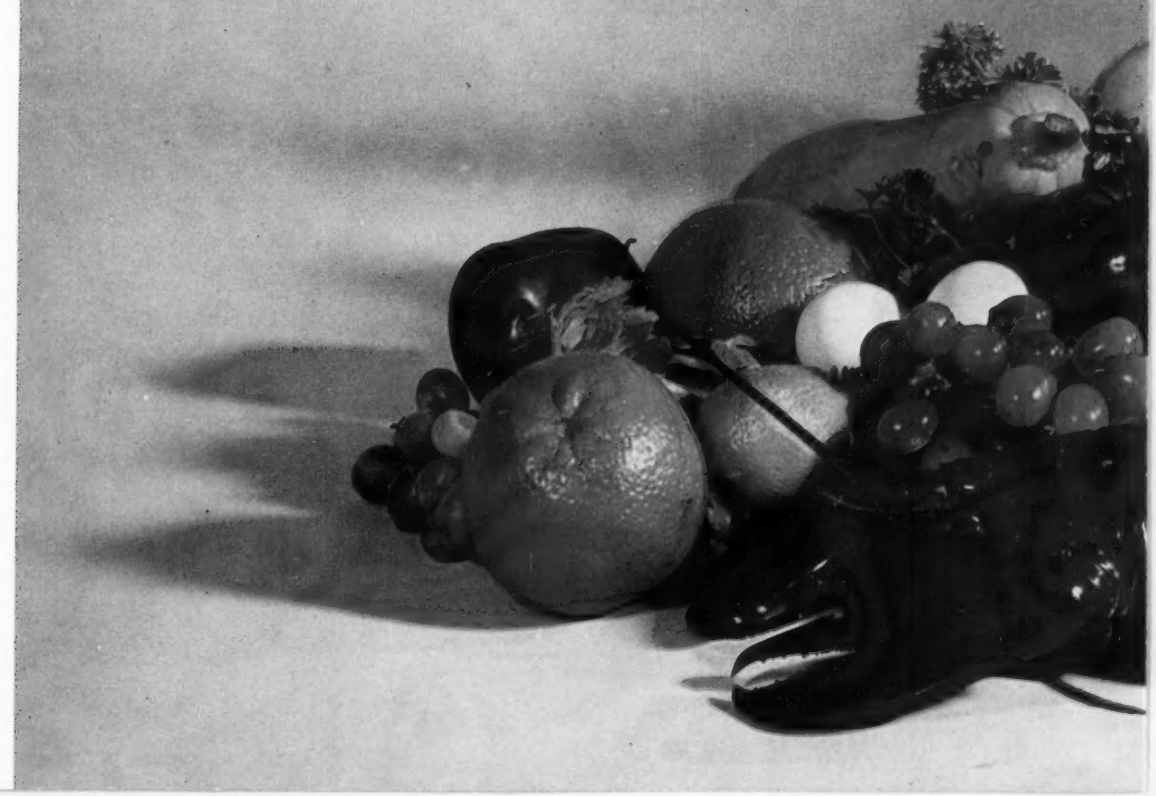
Vitamin Division • **HOFFMANN-LA ROCHE INC.** • Nutley 10, N. J. NOrth 7-5000

New York City: OXford 5-1400 • In Canada: Hoffmann-La Roche Ltd., 1956 Bourdon Street, St. Laurent, Montreal 9, P. Q.

What You Should Know About

Nature's Yellow –

BETA CAROTENE



The Safe, Pure Color

Beta carotene, one of nature's own colors, is found in a wide variety of foods which we eat every day.

Man has duplicated nature's beta carotene so that both have exactly the same properties — safety, purity, attractive color, nutritional value. Food processors use beta carotene to give safe, pleasing color and nutritional value to many foods and beverages.

The Safe, Pure Color With Nutritional Value

Because it is provitamin A (see Words & Meanings), beta carotene also provides essential nutritional value. Therefore, for good health, we should eat vegetables and fruits as well as processed foods which contain beta carotene.

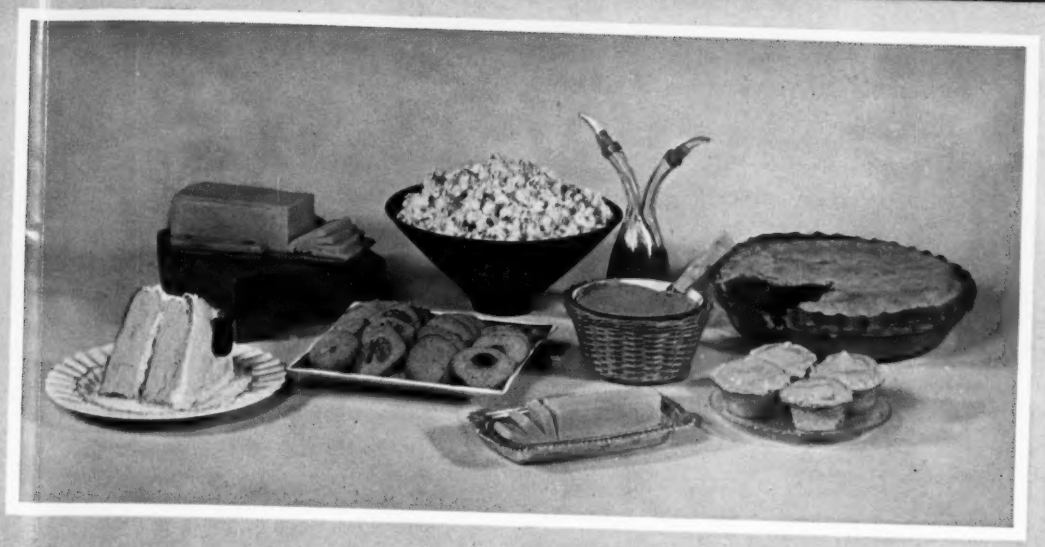
Why We Must Have Vitamin A

Vitamin A is necessary to guard the health of our eyes, our skin and other parts of our body. It builds resistance against infections and protects against night blindness. Vitamin A promotes normal growth from infancy to maturity.

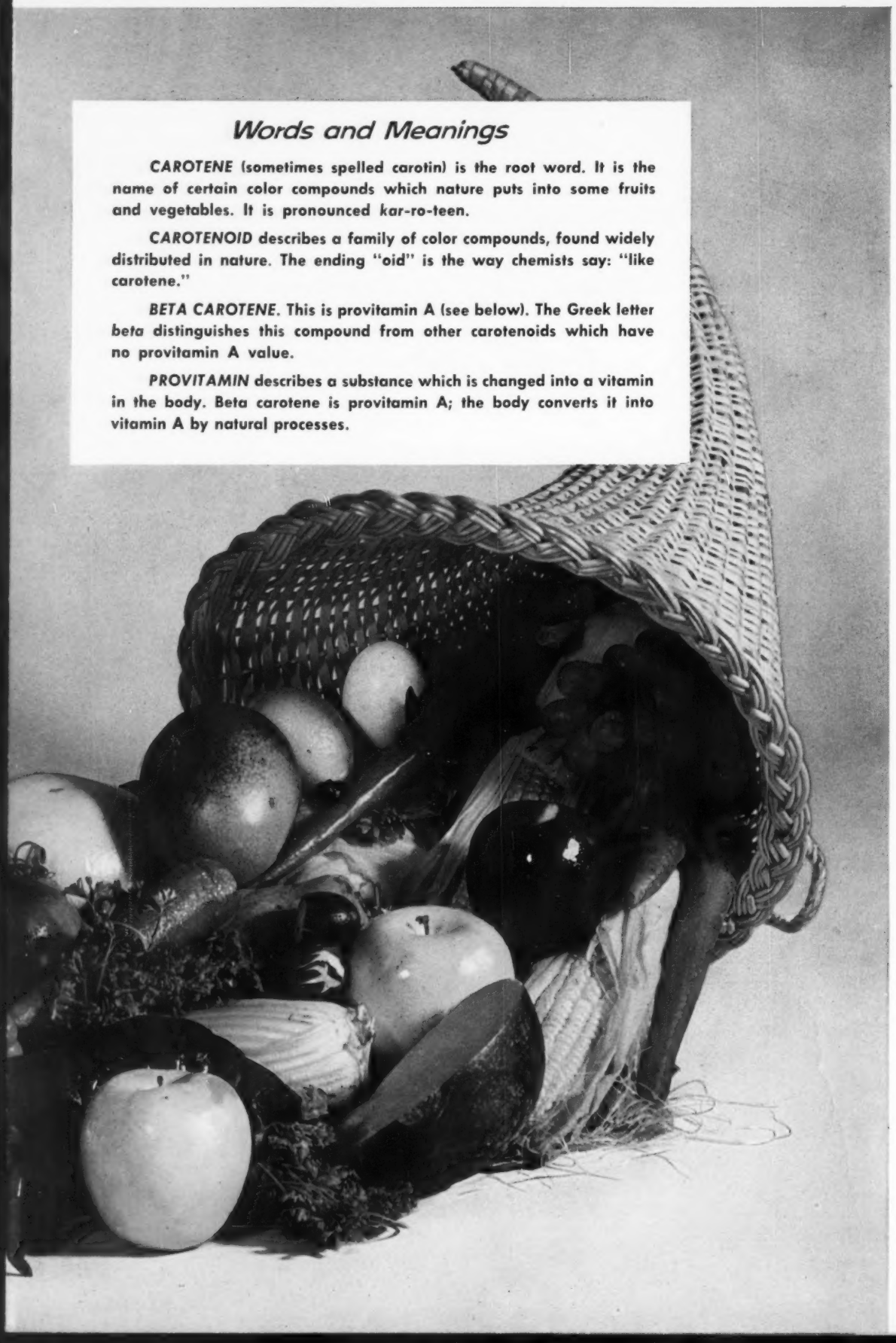
Read Your Food Package Labels

Many processors use beta carotene to make their good foods more appetizing, appealing and nutritious. Thus, you will see on food packages: "Colored with beta carotene (provitamin A)." This statement means that these products have been safely colored with nutritious beta carotene.

This educational chart is sponsored by
Hoffmann-La Roche Inc.,
Vitamin Division
Nutley 10, N. J.



YELLOW
CAKE MIX
Salad and Cooking
OIL
ORANGE DRINK
Yellow
margarine
DESSERT
PUDDING
Cheese
Yellow
SHORTENING



Words and Meanings

CAROTENE **(sometimes spelled carotin) is the root word. It is the name of certain color compounds which nature puts into some fruits and vegetables. It is pronounced *kar*-ro-teen.**

CAROTENOID **describes a family of color compounds, found widely distributed in nature. The ending "oid" is the way chemists say: "like carotene."**

BETA CAROTENE. **This is provitamin A (see below). The Greek letter *beta* distinguishes this compound from other carotenoids which have no provitamin A value.**

PROVITAMIN **describes a substance which is changed into a vitamin in the body. Beta carotene is provitamin A; the body converts it into vitamin A by natural processes.**

Safe
Sure
Yellow
Pure

The Color That Nourishes

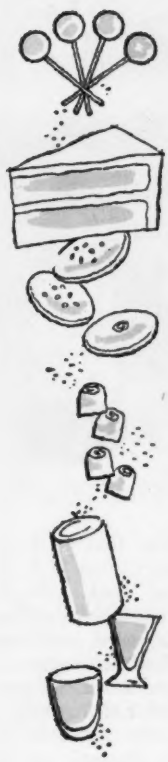
TESTED AND PROVED OK IN ACTUAL INDUSTRY USE

Beta CAROTENE Roche

WITH VITAMIN A POTENCY

Beta Carotene Roche is carotene in the most highly purified form available commercially. It is free of other carotenoids, whose variable color values and lower vitamin A potencies often cause trouble in food processing. Standardize on Beta Carotene Roche for *true carotene yellow color* without any tinge of green or red.

You'll have a better product to make your product better.



NOW 5 CONVENIENT FORMS

• DRY BETA CAROTENE BEADLETS. Type 2.4—S

Water-dispersible, free-flowing beadlets to standardize color of water-base foods. Rapidly dispersible with good stability, Roche Dry Beta Carotene Beadlets contribute a clouded effect similar to that produced by fruit insolubles. Excellent for coloring fruit drinks, gelatin desserts, puddings, dessert toppings, mellorine, confections, egg yolk products, baked goods, cheese, creamed foods, etc., with true natural yellow color. Each gram provides approximately 40,000 U.S.P. units of vitamin A as beta carotene.

• 30% BETA CAROTENE IN VEGETABLE OIL

Liquid suspension. 500,000 U.S.P. units of vitamin A activity per gram. Excellent for natural yellow coloring of foods with high fat content: margarine, shortening, lard, baked goods, cake mixes, processed cheese, egg yolk products, candies, soups, stews, frozen dinners, toppings, frostings. Easily handled: liquid at room temperature. Excellent color stability. High purity insures uniformity. Ask for free Roche technical help with all food-coloring problems.

• 24% BETA CAROTENE: SEMI-SOLID SUSPENSION

Contains 400,000 U.S.P. units of vitamin A activity per gram in vegetable oil. Semi-solid suspension facilitates exact weighing for batch control. Used for same foods mentioned above. Roche Beta Carotene imparts to foods a true, *natural* yellow color without "off" shades. Vitamin A value inherently present adds a nutritional bonus.

• BETA CAROTENE AND VITAMIN A BLENDS

Roche will custom blend its Beta Carotene and vitamin A (acetate or palmitate) in vegetable oil exactly to your specifications and package in sealed, sanitary batch-sized cans carrying labels of your formula. This is another example of the extra service margarine manufacturers and processors of other foods can always expect from Roche.

• BETA CAROTENE BLENDS IN VEGETABLE OIL

Blends of Beta Carotene Roche and vegetable oil are available to your specific requirements to a minimum dilution of 6% beta carotene. Your orders are packaged in batch-size, sealed sanitary cans especially labeled for you. Useful for processing baked goods, cake mixes, shortening and lard, cheese, toppings and frostings, candies, soups and stews, frozen dinners. Your foods receive vitamin A value at no extra cost.

VITAMINS COME RIGHT FROM ROCHE

VITAMIN DIVISION • **HOFFMANN-LA ROCHE INC.** • NUTLEY 10, NEW JERSEY

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Roche®

NEW DESIGN AIR CLEANERS SPEED OUTPUT AT KRAFT

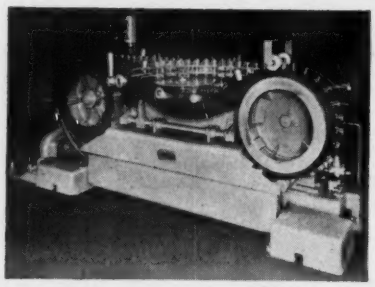
- "Sausage" type Neoprene tubes do trick
- Kraft among first to convert

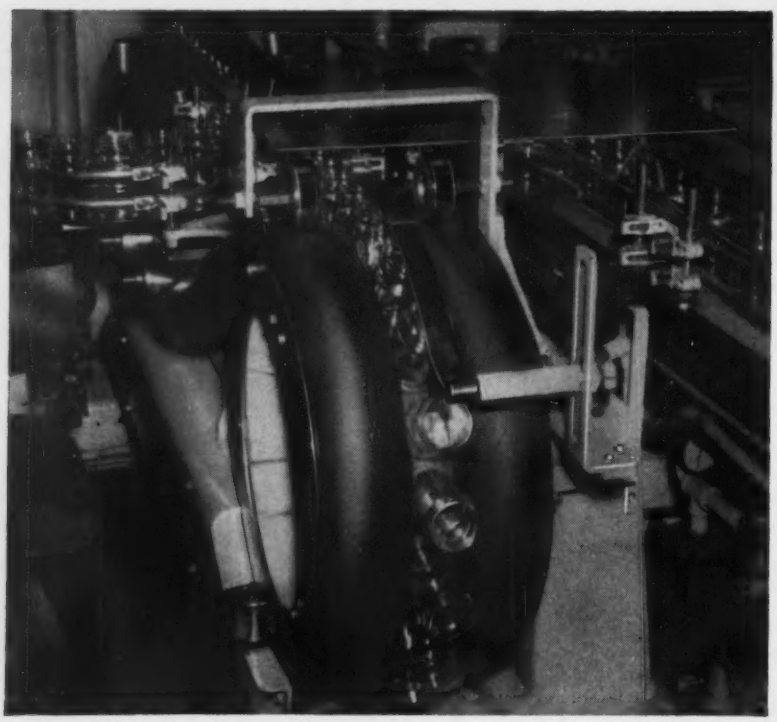
Kraft Food's Miracle Whip and Miracle French Dressing are as well known and as widely used by American housewives as their favorite brand of cosmetics. In the business world Kraft, a division of National Dairy Products Corp., enjoys a reputation as one of the nation's most able producers and merchandisers of food products.

Part, at least, of the KRAFT success is in its willingness to venture into the realm of new departures from old production principles. Pneumatic's revolutionary PNEUMACLEAN Air Cleaner is an example. Employing a never before used method of container handling – continuous air inflated Neoprene tubes – it cushions the jars or bottles gently while it inverts them, holds them firmly and moves them with record speed through the process of jet air cleaning. KRAFT quickly saw the advantages, installed the equipment and is now reaping the benefits in terms of much faster delivery of cleaned containers – 270 or more per minute.

KRAFT, a long time advocate of Pneumatic "lower cost per container" operation also uses Pneumatic equipment for filling, capping and, to considerable extent, labeling these containers.

When you're looking for the latest method of doing an automatic, or semi-automatic, packaging or bottling job look the way the leading producers in all fields do – to Pneumatic.





KRAFT runs both its wide mouth salad dressing jars as well as its narrow neck containers for a variety of sauces and dressings through its Pneumaclean units with equal facility.

Visit BOOTH 307, PMMI SHOW, New York Coliseum, Nov. 17-20, 1959

PNEUMATIC SCALE CORP., LTD., 91 Newport Avenue, Quincy 71, Mass. *Sales Offices: New York; Chicago; Dallas; Rochester. Agents: Fred Todt Company at Los Angeles, San Francisco and Seattle; Rockwell Pneumatic Scale Ltd., Edgware Road, London, N.W. 2, England; O.R.M.A., Paris 8, France. Subsidiaries: Delamere & Williams Co., Ltd., Toronto; Carbert Mfg. Co., Inc., Cambridge, Mass.*

PNEUMATIC

FOOD ENGINEERING
FOR MANAGEMENT IN MANUFACTURING PACKAGING, MARKETING

Operating Statement is Your "Working Sheet"

Representative Plant Costs & Margins per 100 Lb. of Milk & Cream Processed, 1953-1958
(Collated by USDA From Reports of Selected Dairy Firms)

	1953 (51 Firms)	1955 (83 Firms)	1957 (80 Firms)	July-Sept. 1958 (80 Firms)
Net Sales	$11.12	$10.95	$11.15	$10.95
Raw material costs:				
Raw milk, cream	5.43	5.12	5.14	4.90
Other	.90	.94	.87	.87
Total	6.33	6.06	6.01	5.77
Gross margin	4.79	4.91	5.14	5.18
Operating costs:				
Salaries, wages, commissions*	2.19	2.28	2.50	2.59
Containers	.62	.70	.71	.71
Operating supplies	.32	.32	.29	.29
Repairs, rent, depreciation	.52	.60	.67	.69
Taxes	.06	.06	.06	.06
Insurance	.02	.04	.04	.04
Services	.19	.18	.17	.19
Advertising	.15	.18	.18	.18
General	.13	.14	.15	.15
Total	4.20	4.50	4.77	4.89
Net margin**	.59	.40	.37	.29

*Includes state unemployment, Federal old age, workmen's compensation, and employee benefits.
**Net returns to owners before income taxes.

How to Get *Proper Perspective* for Cutting Costs

Many miss by failing to take the right sights—which, says Expert French, you really get by standing above, instead of on, your operating statement . . . Timely tips for every food operator

WE ALMOST REVERE cost reduction. It's discussed with nearly the same esteem as good plumbing, clean underwear, or motherhood.

Yet we often fail to do a good job of reducing costs. Why should this be?

▶ **We contend that one big reason for abortive food-operation cost-cutting programs is the fact that we don't put costs in their proper perspective.**

CHARLES E. FRENCH

Assistant Head, Agricultural Economics Department, Purdue University, Lafayette, Ind.

Best perspective is gained by standing at the north end of an operating statement and gazing slowly southward. To illustrate, let's consider cost cutting in fluid milk plants.

▶ **If you are in another branch of the industry, you need only bear in mind that these principles hold equally well for any type of food processing business.**

The accompanying table (figures based on reports from above-average independent fluid milk plants of varying size throughout the U. S.) provides us with a representative operating statement to scan for our perspective.

Here, our attention tends to focus on opportunities for cost reductions in the major expenditure areas—those listed first.

This doesn't imply, however, that important savings can't be found in the minor-cost areas. Rather, economic prudence initially leads our

Tells Volume Needed to Balance Ingredient Loss

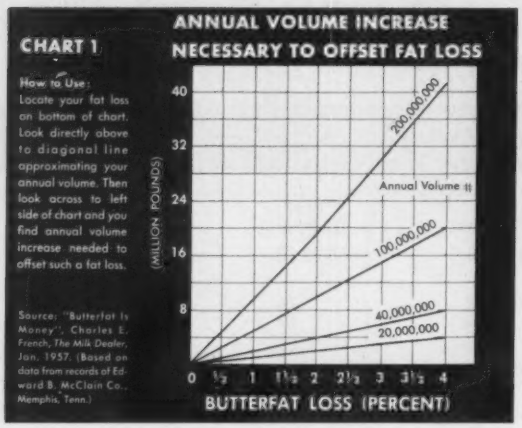


CHART 1
ANNUAL VOLUME INCREASE NECESSARY TO OFFSET FAT LOSS
How to Use:
Locate your fat loss on bottom of chart. Look directly above to diagonal line approximating your annual volume. Then look across to left side of chart and you find annual volume increase needed to offset such a fat loss.
Source: "Butterfat Is Money", Charles E. French, The Milk Dealer, Jan. 1957. (Based on data from records of Edward B. McClain Co., Memphis, Tenn.)
(MILLIONS OF POUNDS)
40
32
24
16
8
200,000,000
Annual Volume
100,000,000
40,000,000
20,000,000
0 ½ 1 1½ 2 2½ 3 3½ 4
BUTTERFAT LOSS (PERCENT)

Checks Labor Savings vs. Sales Increases

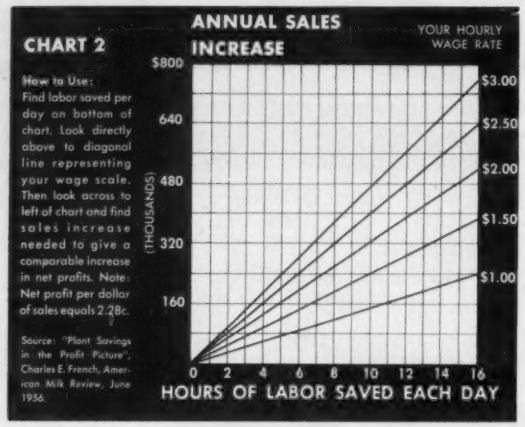


CHART 2
ANNUAL SALES INCREASE
YOUR HOURLY WAGE RATE
How to Use:
Find labor saved per day on bottom of chart. Look directly above to diagonal line representing your wage scale. Then look across to left of chart and find sales increase needed to give a comparable increase in net profits. Note: Net profit per dollar of sales equals 2.28c.
Source: "Plant Savings in the Profit Picture", Charles E. French, American Milk Review, June 1956.
(THOUSANDS)
$800
640
480
320
160
$3.00
$2.50
$2.00
$1.50
$1.00
0 2 4 6 8 10 12 14 16
HOURS OF LABOR SAVED EACH DAY

eye toward the greater opportunities.

Looking down the statement, we first observe sales income. Since this is not a cost area, we won't pause here long. But one comment seems in order. Plants should probably expect the unit selling price of fluid milk to decline relative to the unit selling of many other commodities and relative to the unit cost of many items going into fluid milk.

Likely, fluid milk will reduce service value relative to product value —a trend opposite to that in the general run of food business. This is due to the traditional high relative service costs of milk and recent trends away from some of these services. However, manufactured dairy products will probably continue to add services.

But let us continue down the statement:

In dairy operations, milk is the main outlay item (currently about one-half of the sales dollar). How often we overlook this fact. But a manager must keep his eye on them, other ingredient costs, too. Proper control may eliminate some loss, insure optimum quantities, and provide for substitution of lower-cost sources where available.

Milk itself offers great potential leverage for savings. Average milk loss in a good fluid operation is probably slightly under 2%. Federal orders generally put losses of more than 2% in Class I utilization to protect farmers against poor plant procedures.

However, the range in fat loss percentages among plants is extremely wide. Records of cost-comparison organizations, such as The Edward B. McClain Co. of Memphis, show that losses exceeding 5% for extended periods are not unusual.

Here, Chart 1 dramatizes the importance of proper perspective—illustrating the annual volume increases necessary to offset increases in fat loss with reasonable profit percentages and fat costs.

Factors which affect fat loss make an imposing list. Included are: (1) Bad sampling, (2) inaccurate weights, (3) poor standardization, (4) general leakage and spillage, (5) bottle breakage and leaks, (6) overfilling, (7) poor salvage on returns, (8) theft and pilferage, (9) evaporation, (10) poor control of donations, and (11) product spoilage.

Salaries and Commissions

Next most important outlay is for labor—currently about one-fourth of the sales dollar or one-half of the gross margin in fluid milk plants. This is broad, and we don't have good labor-type breakdowns. However, we can expect about one nickel of each sales dollar to go for administration costs.

Also, selling and delivery labor costs much more than plant labor. Here's a helpful comparison: Firms may be expected currently to have total plant expenses of about 15-20¢ of each sales dollar and selling and delivery expenses of about 20-25¢. The latter expenses are made up of a much higher proportion of labor than are plant expenses.

Plant labor savings are very important. Starting in the receiving operations, probably the major considerations involve handling dual intakes. In small plants especially, 100% bulk receiving may cut costs substantially. One Minnesota study placed reasonable savings for a 40,000 lb.-per-day plant at 22¢ per cwt.; a 75,000 lb. plant at 11¢; and a 160,000 lb. plant at 7¢. Studies at Purdue would suggest that these figures may be quite realistic as an average. In fact, some plants can expect much higher savings.

Many plants cannot convert to 100% bulk, however, and must live for some time with dual facilities. Our studies suggest that a plant receiving 75,000 lb. or less should consider only one man for intake. And two men should be able to handle up to 225,000 lb. Three- and four-man crews are generally inefficient. When a volume is only slightly above a crew breakover point, attempts should be made to schedule these men for additional work, as bulk milk receiving.

Processing is moving toward automation. However, possibilities do exist for improving labor efficiencies with present equipment. Progressive plants have cut bottling crews essentially in half by rearrangement of bottling machines and use of accumulating tables. Well-placed conveyors, switches, small tools, and dials allow meaningful savings.

Plant processes suggest large-scale automation. Cleaning has been automatized in some plants. Generally, continuous routines give many advantages over batch. However, need is for a thorough evaluation of the automation potential.

Other big plant-labor areas are storage and load-out. Cramped storage areas have been a big problem. Our work shows that stacking cases 1-to-6 high takes a fairly constant labor input per case. However, if

Gives You Gage for Buying Labor-Saving Units

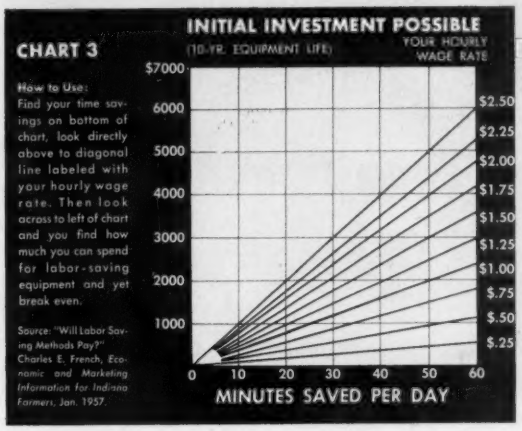
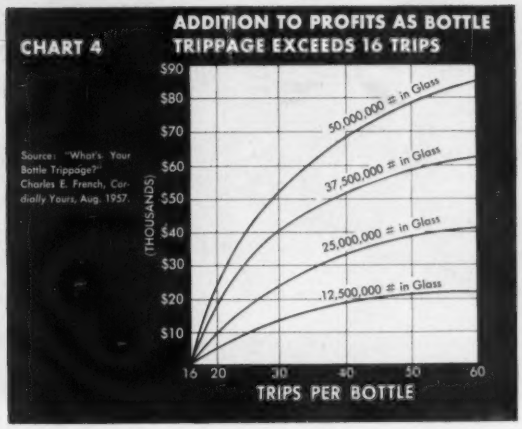


CHART 3
How to Use:
Find your time savings on bottom of chart, look directly above to diagonal line labeled with your hourly wage rate. Then look across to left of chart and you find how much you can spend for labor-saving equipment and yet break even.
Source: "Will Labor Saving Methods Pay?" Charles E. French, Economic and Marketing Information for Indiana Farmers, Jan. 1957.
INITIAL INVESTMENT POSSIBLE
(10-YR. EQUIPMENT LIFE)
YOUR HOURLY WAGE RATE
$7000
6000
5000
4000
3000
2000
1000
$2.50
$2.25
$2.00
$1.75
$1.50
$1.25
$1.00
$.75
$.50
$.25
0 10 20 30 40 50 60
MINUTES SAVED PER DAY

How Boosting Bottle-Trippage Ups Savings



we go, say, 10 high rather than 6, our labor requirements go up 21% in order to get 66% more cases stored. Such information is useful in evaluating new storage areas.

Another problem is speed up of load-out. Recently, 6 out of 21 plants with more than 30,000 lb. daily intake were found to use dolly load-out. These systems have been put in for speed and, on the surface, they look fairly efficient. However, the pre-assembly time needed for dolly loads reduces efficiency much below that of conveyor systems. Cost cutting now seems possible here, especially since we have refrigerated trucks.

In most cases, feasible savings in plant labor appear to be much better bets to increase profits than do sales increases. Chart 2 illustrates.

Basic trends toward fewer services in milk delivery are probably major factors. The largest single savings was the shift to alternate day delivery.

Further affecting delivery costs is the move toward store sales. Undoubtedly, this trend will continue, but there are good reasons for individual plants to hold to house-to-house delivery, for these customers are much "safer" so far as individual dairies are concerned.

Unit-load handling and basic institutional changes, such as the shift toward vendor operators, are also major factors. Selling and delivery are big areas and probably the ones begging most for penetrating cost analysis.

Opportunities for cutting labor costs in administration involve two areas—time of the manager and time of those responsible for records and reports.

Management time is valuable and management today must delegate. This is not easy. It means decentralization. And so the manager must condition himself—especially to accept the ideas and mistakes of others.

He must set up a channel to assure controls. This means policy definitions, job specifications, and setting up goals. Ideas must flow both up and down. Good records and reports are the lubricants. Likely, there are great cost-saving opportunities here.

Management today tends to become a science, and this calls for scientific tools. We have been highly encouraged by use of such modern management tools as electronic brains, mathematical programming, and operations research. Granted, these do not replace management. But they can aid management—and in the process increase efficiency many-fold.

Repairs, Rent, Depreciation

Many are quite concerned about the costs of repairs, rent, and depreciation. These items run about 65-70 per cwt. of fluid milk sold currently. To put them in our perspective tends to de-emphasize them relative to milk and labor expenses.

Most of these costs go into machinery and other capital items used to save more expensive labor. Thus, it may well be that these items should climb much higher.

Capital item purchases in processing plants have often been subjected to very short pay-back periods. With present tax laws and current capital budgeting procedures, such short pay-backs are probably not realistic. Most of these outlays should probably be evaluated on an annual use cost of about 15% of initial investment. On this basis, a small labor savings can justify a large capital outlay. Chart 3 points this up.

Container Aspects

Containers account for an important part of the price of fluid milk (currently about 70¢ per cwt.). Moreover, their costs have advanced substantially in recent years. Big arguments rage about the cost-cutting possibilities of a paper-and-glass product line as against a 100% paper line. Generally, these arguments tend to resolve themselves around cost control on use of containers, especially as reflected in glass-bottle trippage.

Trippage can vary widely by products and by plants. It should be known within reason for each product. Rate of returned product can influence paper package cost considerably.

Deposits on glass bottles have often been dropped to compete more favorably with paper. Thus, the most effective means of obtaining high trippage has been lost.

It is not unusual for trippage to drop below 10. Costs for glass skyrocket in this area. For example, the annual glass bill for a plant handling a 50,000,000-lb. volume in glass would approach $250,000 if its trippage dropped below 10. See Chart 4.

So, then cost-reduction opportunities are legion—with most of them to be found in rather simple relationships when viewed in proper perspective. —*End*

For free reprint of this article, write P-1 on Reader Service Card, back of issue

DUTCH TREAT is roasted frozen turkey from U. S. Poultry consumption is gaining fast in Western Europe.

DUTCH SUPERMARKET recently opened by de Gruyter, leading manufacturer-distributor, displays wide range of items. Of de G's 450 stores, 175 now are self-service. Number of self-service units is rapidly increasing in Europe.

Traveling FE Editor Witnesses

Food Revolution in Europe

British go American way . . . Germans set pace on Continent . . . French modernize canning plants . . . Danish and Dutch push exports

FE Reports on Europe
Part III—In Various Countries

Epicurean taste, some say, is coming back to England—where it reached a zenith before Puritanism decreed it morally wrong to enjoy eating. In any event, the British are upgrading their diet by consuming 35% more dairy products per capita than before the war, 6% more meat, 6% more eggs, and 5% more vegetables (1957 data).

Consumer expenditures for food have increased more than 20% since 1948 and are still climbing. Of a personal spending increase of 3.2%, or $9 billion, for the first quarter of this year, one-third went for food.

In Britain there are more than 3,500,000 working housewives, who have very little time to shop and prepare meals. But everywhere there is a demand for speed in shopping, convenience, and swiftness in preparation—and guarantee that a hastily bought article will be of a consistent standard. Hence the growth of multiple-product shops, self-service stores, and demand for prepackaged branded items.

Interesting views about the food-buying psychology of British housewives recently were expressed by an English homemaker-author. "They like something if it looks pretty, but they distrust the unusual and are on the whole much more attracted by the idea of something being labor saving—sliced bread, washed leeks, fish made up in frozen fingers—than specifically interested in taste.

"It would not be altogether surprising if they were simply bewildered by the amount of choice that faces them . . . The present plenty in shops is almost unbelievable. One large store in London has a list of 100 cheeses. Varieties of canned goods run into the hundreds. Every day seems to produce new kinds of frozen foods, and within the past year or so frozen food cabinets have begun to appear in villages and shops all over the country."

Evidence that British tastes can change somewhat is seen in the fact that coffee consumption has increased 128% (now 1.6 lb. per capita) whereas tea drinking is up only 5.4% (to 9.8 lb.).

Here are other significant changes: Liquid milk up 49% to 323.6 lb. per capita; dried whole milk, 159% to 1.6 lb.; dried skim milk, 75% to 1.4 lb.; canned meat (imported), 193% to 9.1 lb.; poultry, 54% to 7.8 lb.; shell eggs, 14% to 28.3 lb.; canned tomatoes, 140% to 4.8 lb.; other canned vegetables, 165% to 5.4 lb.; canned fruit, 60% to 16.1 lb.; fruit juices, 97.5% to 4.6 lb.

Grain products are down 10% to 188.1 lb.; fish, 11.4% to 19.4 lb.; fruits, 2% to 121.8 lb.

Milk has become a favorite refreshment in Britain, an official of the British Food Ministry told this writer. There are milk bars everywhere, and the beverage is sold by vending machines at a great rate.

The Food Ministry also notes that broiler chickens now are very popular in Britain, that frozen foods are gaining rapidly, and that calorie consumption is 100 higher than in the US.

The Common Market came into the discussion here as everywhere. England is concerned about losing exports to that area through disad-

FRANK K. LAWLER
Editor, "Food Engineering"

PROCESSED FOODS in attractive containers are packed by European manufacturers in rapidly increasing quantities. Nor is convenience overlooked. Mayonnaise is in collapsible metal tubes. Worcester sauce bottle has extra plastic cap with dispensing nozzle and spoon.

vantageous tariffs. So it is participating in an effort to organize the outer seven countries, with the expectation of forming an economic bridge with the inner six. The outer seven had a meeting of technical delegates in July, and government representatives were expected to get together soon to sign an agreement.

The UK food manufacturing industry itself produces, according to R. S. Worth, president of Food Manufacturers Federation, Inc., the following qualities:

400,000 tons of canned fruit and vegetables
450,000 tons of biscuits
350,000 tons of sugar confectionery
325,000 tons of cocoa and chocolate confectionery
225 million gallons of soft drinks
250,000 tons of sausages
75,000 tons of condensed milks
50,000 tons of milk powder
80,000 tons of pickles and sauces
220,000 tons of jam
100,000 tons of canned soup

Among new convenience foods in Britain are precooked frozen dinners, cake and pudding mixes, canned and dehydrated soups.

Britain is the world's largest food importer, only about half its food requirements being produced on its own farms (it was one-third prewar). But it also exports significant quantities of food and drink—to the value of $450 million (in '55).

Frenchman Looks at Trends

How a leading French food manufacturer sizes up food trends and problems in his country comes from an interview by the author with Maurice Gay, president of Petitjean Gay & Co., Paris. Canned food consumption is growing in his country, Mr. Gay says, but not to the extent that it is in England or the US.

France has 600 canning plants—too many in Mr. Gay's opinion. Most of these produce vegetables, and some pack fruits. Many have bought modern equipment and compete on a highly efficient basis.

Mr. Gay cites France's unhappy experience with frozen foods after World War II, when lack of adequate refrigeration resulted in failure. Few companies are freezing now, but the French canner expects frozen products to stage a comeback in the next few years.

In distribution, Mr. Gay not only cites growth in self-service, but points to a revolutionary trend to the formation of the retail co-ops for more efficient buying through one distributor. He mentions that a supermarket has been operating successfully in Paris for the past year, and foresees an expansion in this type of distribution. He reports, too, that the French equivalent of the American 5 & 10¢ store now is selling food. These popular shops handle second-quality products, and are not self-service. In contrast, chain stores sell good quality items, Mr. Gay observes, and none of them has its own factories.

Impressed by the impact of the Common Market, the French canner mentioned an interesting sidelight: Canners now are holding meetings to establish standards.

To this observer, the seriousness with which food companies are tackling this problem strongly indicates that the Common Market will be successful.

Germany's Progress Rapid

It is conceded that Western Germany is setting the pace in progress toward modern food manufacturing and distribution on the Continent. In an interview with officials of the German Ministry of Agriculture, Food & Forestry, the author was able to highlight the trends.

American methods are beginning to show themselves in the convenience items and packaging techniques. Paralleling this is an increase in self-service stores and supermarkets, with the existing shops being converted to self-service. And the stores now sell a wide range of food products and household items.

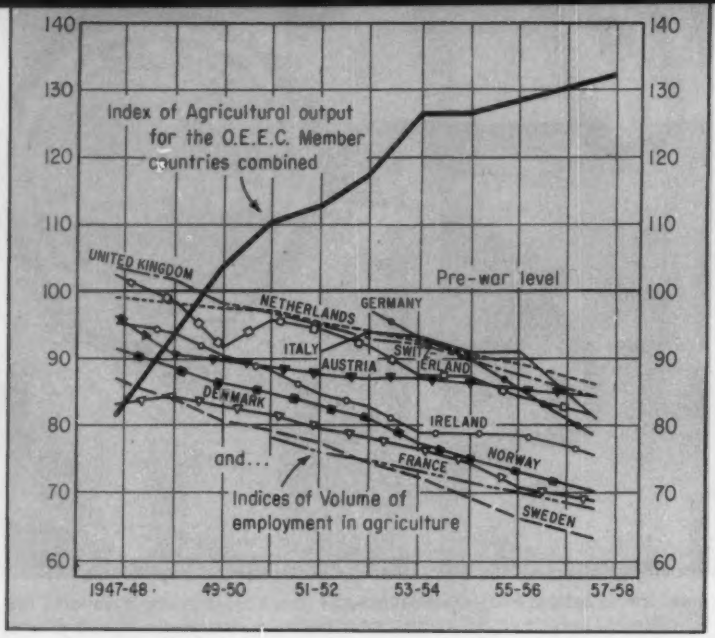
Few manufacturers are in the retail business, but some distributors have their own factories. One is the largest meat packer in Germany and it also operates bread bakeries.

Retail cooperatives have been organized to purchase at low prices and to import products such as fruit preserves and frozen poultry from the US.

Another trend in food distribution is to vertical cooperative arrangements perhaps involving 20 or 30 retailers, 2 wholesalers, and 3 or 4 manufacturers. This improves the bargaining position of retailers and assures better quality of products.

The power of consumer co-ops was mentioned earlier (Sept., p. 42).

The retailers sell such convenience items as processed vegetables, frozen



FARM PRODUCTION has risen sharply in Western Europe, and number of people on farms has declined. Mechanization and government productivity programs are key factors. But agricultural imports still total about $6 billion, not counting $2 billion from territories. (Courtesy OEEC)

rolled stuffed meats, meat and potatoes, meat and noodles, soup mixes, instant coffee, ham and beans, and bacon and beans, as well as ravioli and egg with tomato sauce. They carry frozen fish fillets, too, but not prepackaged. For the most part, housewives must buy separate cans to make up prepared meals.

Generally, housewives like to prepare their own food, but working women are being weaned away from old ways of meal preparation inasmuch as they are earning more money to spend for food.

Prepared frozen dinners are gaining sales rapidly, and the number of low-temperature refrigerators in homes is increasing. Frozen foods are gaining faster than any other type of item, with 10,000 tons being consumed last year in Germany.

Expenditure for food has been rising since 1947, and increased from 205 to 220 marks per capita per month in the last year. People are buying better foods.

Poultry consumption profited by this trend for an increase to 5.5 lb. per capita from 2.6 lb. in 1950-51, and while poultry is an expensive item, it is predicted that per capita consumption will rise to 11 or 12 lb. in the future. German consumers are buying American ready-to-cook poultry as well as pre-grilled chicken, ready to heat and eat, from Denmark. Chicken is the most popular type of fowl.

Food distribution is being facilitated by supermarkets located in the shopping centers of new housing developments, in which grocery stores are distributed on a planned basis for convenience.

West Germany is upping food production through government integration of small farms into larger acreage that can be cultivated by modern mechanical equipment.

And this country is exporting processed foods, including canned hams, beer, flour, and black bread. Total export of agricultural products, including livestock, were $240 million for '58. Germany imports $722 million of US farm products.

At the same time, Germany is importing fresh and canned fruits, vegetables and fruit juices, as well as meat, poultry, cheese, honey, and cocoa products, and also 50% of its egg supply. Imports continue to rise in almost all processed and high-grade foods from abroad.

The Margarin Union in Hamburg is building a business in ice cream, and has placed 20,000 company-owned low-temperature cabinets in retail stores. Practically nothing before the war, ice cream consumption now is 2 qt. per capita, and is expected to go to 3 or 4 qt. soon. The Germans buy ice cream in small containers or on a stick and eat it while walking, not much being consumed at home.

Butter consumption has risen to 16.8 lb. per person, compared to 25.8 lb. for margarine.

Success of meat canners in Denmark in exporting larger quantities of their products is indicated by the expansion of can-making facilities. In a visit to the modern Haustrups Fabrikeras plant, the author was amazed at the rate of expansion. Ten years ago this plant had two small can-making lines. Now it has 10 lines and will soon go to 16 with the addition of large new production and engineering facilities.

Its capacity amounts to 1.5 million cans a day, with 80% of these being used for export products, principally meats. It has difficulty meeting the demand from meat canners, who are selling increasing quantities of their products in the US.

Dutch After US Market

Food trends in the Netherlands parallel those in other western European nations. And here top manufacturers of broad product lines operate their own retail stores. De-Gruyter has 450 shops, 175 of them now being self-service. Heyn has 350 stores, and executives told FE's editor that the 25 of these which have been converted to self-service now do 50% of the business.

Aside from trends, the most significant factor in the Netherlands is emphasis on food exports. Important in this effort is strict quality requirements maintained by inspection agencies for each type of food. These must put their stamp of approval on shipments before they leave the country.

The results are reflected in American supermarkets, which are devoting more space to a variety of Dutch items formerly sold in gourmet shops. Significantly, the Dutch are packaging specially for the American market, and they are stepping up their promotion here on canned hams and other meats, cheese, confectionery, and beverages.

American dairies perhaps can take a tip from the Dutch on products sold in Holland. At Melk Centrale Noord, Amsterdam, the author sampled bottled liquid yogurt (thick and thin), puddings (vanilla and chocolate), rice, wheat and oat porridges for quick convenient breakfasts, as well as conventional buttermilk and chocolate milk.

Chocolate milk is sterilized after bottling, as is some regular milk in summer (few refrigerators), but puddings and porridges are merely pasteurized. Both heat treatments are applied in continuous hydrostatic cookers. —*End*

The Case for 'Split' Tech Staffs

Division into pro, semi-pro, and technician levels seen curbing waste of skills and assuring top return from expensive talents . . . Four points for measuring your own setup

Optimum performance: By 'breaking' to three levels of competency.

HOW DOES the average food plant get its technical people today?

Does it employ only college graduates from engineering, chemistry, or food technical programs? Does it seek the products of tech institutes? Or does it simply bring in bright high school students and have them learn through experience?

Answer: There is no uniform method. Practices vary from company to company. And, frankly, the functional use–and misuse–of the skills of the incoming people is often quite appalling.

So, some pertinent considerations are in order on how to go about hiring, assigning, and developing tech staffers.

Here, we offer the thesis that the food industry has now progressed to where it is ready for "split level" technical employment. In short, its technical people should be carefully sought at two levels–and perhaps even at three.

This thesis may be brought into focus by weighing four points in terms of your own organization's status:

▶ Point 1–Is your company ready for professionalism?

First, can you now profitably employ the "upper level" food scientist-engineer? This is the man (and let's not call him a technologist, for he's no mere technician) who has topped off sound undergraduate training with at least one year of grad study and a food-field thesis subject. He is a true professional.

There's no argument about his place in the field. Food today moves toward untold progress through advanced fusion of science and engineering. Consider the potential of the new forms of food-processing energy: Nuclear, ultrasonic, infra-red, electrostatic, radio-frequency. Given personnel capable of exploiting them, remarkable strides are possible.

Then there is the trend toward automation in food analysis and process control. Procedures once tediously performed in the lab by a white-jacketed graduate chemist have now been sped by mechanization, and they are starting to appear on the process line. Automatic systems for controlling food quality are emerging. The need is evident for professional-caliber talent–part scientist, part engineer–to plan and supervise these transformations.

Important point is that technical progress in the food plant mainly relies on creative thinking–thinking that originates through sound preparation in sciences and engineering.

▶ Point 2–Are you ready for semi-professionalism?

Next consideration is the so-called non-creative technical work. Who will do it?

If your college personnel abandons bench-test work, QC posts, and process-operation jobs, and starts working with cerebrum, chart records, and perhaps a computer, it's obvious that others must handle the routine, but still complex, chores.

These others may be found on the "main-floor level," represented by roughly a hundred 2-yr. curricula, post-high school, tech institutes. We have here a major potential source for staffing U.S. food plants. The food field is more than ready for these semi-pros. They can be hired direct from the institutes.

Today, it's a sin for a company to make only partial use of the top talents of the few new engineers and scientists it manages to attract. Here, planned hiring and intelligent use of semi-pros will help maximize results from your pro staff.

▶ Point 3–How many 'chiefs' and how many 'indians'?

The ratio between pros and semi-pros is the next question. The pros will now be delving most strongly in research and development. They'll also function close to management in top-drawer planning.

The semi-pro, on the other hand, will operate the instruments and processes, carry out the QC procedures, set up the tests and pilot processes in R & D, gather the tech data for planning.

Ideally, several semi-pros should "stand behind" each pro. An optimum figure might be 4 to 1.

▶ Point 4–Does a 'third level' of personnel come into the picture?

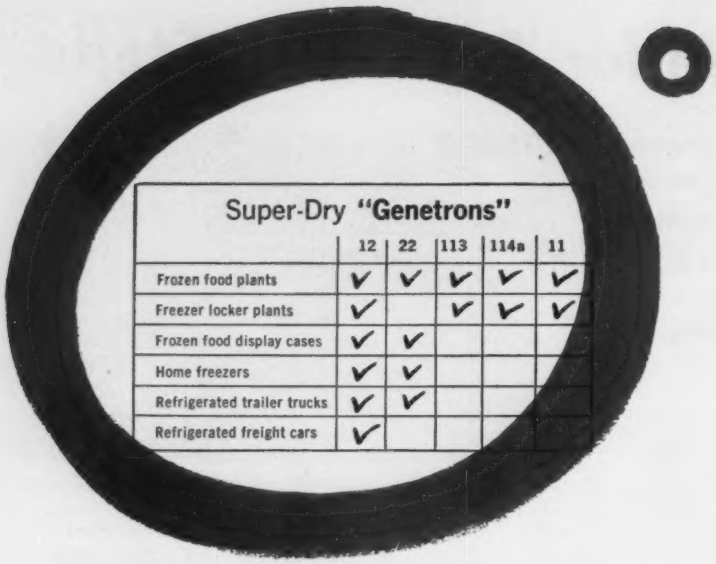
Today's semi-pro is a valuable person meriting a good salary. He must be as well trained as was the graduate technologist of 10 yr. ago. Hence, why not sign on some less-skilled people so your semi-pro's time isn't wasted on lower chores?

Such 'lower level' staffers would also require certain formal education. Ideal would be the vocational high school grad who's had an appropriate food-science course. An active operation might well call for two such industrial technicians assisting each semi-pro.

Thus, an enterprising, average-size food plant of 200 employees might be served by: 1 pro for planning, developing, and supervising processes; 1 pro for the same with products; 8 semi-pros to work in above areas; plus 16 technicians.

—*End*

LLOYD E. SLATER
Executive Director, The Foundation for Instrumentation Education & Research



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genetron 22 GREEN LABEL $CHClF_2$ MONOCHLORODIFLUOROMETHANE
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Ole Sage Episode

Is Public Relations Worth It?

ED STRONG leisurely lit his pipe as the waiters began pouring coffee at the Guff & Gripers' regular luncheon meeting. Then he came up with a challenge: "Seems to me we're due a few more details on Mull & Mull's public relations blitzkrieg, Ole."

Barney Hasbrook cut in: "Before Ole takes you up on that, Ed, don't you think we ought to brief our guest?" He gestured toward J. J. Talmerage, elderly owner of a small food plant, who had come with Ole.

"Good idea," Ed assented. "Why don't you fill in, Barney?"

"M&M's problem has been to overcome the costly ill effects of false rumors—circulated years ago by striking employees—of unsafe products," Barney explained.

He went on: "Ole told us how employee groups were assured of the purity and wholesomeness of M&M products by the government inspectors stationed at the plants, and how all employees were taken on complete plant tours so that on 'Family Day' each worker could guide his own people through the plant. And that about covers the situation, I believe." He turned to M&M's consultant. "Take over, Ole."

"One point omitted," pre-empted Ed, holding up his hand. "M&M workers were so impressed by what they'd learned from the government representatives that they asked for the same facts to be reviewed by government men at local PTA, church, and civic meetings.

"Now carry on, Ole, and excuse me for interrupting," he apologized, "but in my opinion, that point's too important to skip."

"That is a key point," Ole Sage agreed, "especially since that particular development laid the foundation for another fortunate 'break'."

"Modest, isn't he?" mocked Batt Bulwark, M&M's works manager. "He sets off a charge of dynamite, and is completely surprised when it goes 'boom!'"

"Well, don't hold out on us," Talmerage urged humorously. "Let's hear about this 'break.' I take it that your 'Family Day' tours went off without a hitch."

"Uh-uh," Ole answered, shaking his head. "You see, we had timed the trips through the plant as they were made initially by employee groups. We then allowed what we thought would be ample margin in planning the family tours.

"Everything had to mesh: Each employee had to leave his job on schedule to meet members of his family, who were to arrive at a fixed time for the tour.

"Relief workers were to replace those serving as guides to their families, and, in turn, move on schedule from one operation to another."

"So what slipped?" asked Ed.

Ole replied: "Before our first family tour was over, we knew that our planning was 'way off. The first group of families moved leisurely, taking time as *they* chose, not as we *had planned*. Of course, this was heartening in one way—it was a sign of more interest than we had anticipated. But it was immediately obvious that we wouldn't have enough relief workers."

"What did you do?" Ed asked.

"We called for volunteers from all management and office workers," Ole said. "Many had had plant experience. These gladly put on the coats and uniforms we passed out, then joined the relief workers on the production lines. As several commented, they 'joined the fun.'"

Barney Hasbrook lifted his eyebrows. "How about the union?"

"We consulted with union officials, several of whom were at the plant all through 'Family Day,' before we asked for volunteers. The union was with us," Ole declared.

"Who were your relief workers, anyway?" Ed inquired.

"Mostly former employees, some in retirement, and a few others recommended by regular workers as having had enough experience."

"I'll bet production went to pot that day," Ed chuckled.

"That's what we had expected," Ole admitted. "But imagine our surprise when we learned that the day's output set an all-time record!"

After the shock passed, he continued thoughtfully: "The answer, of course, is that every worker was 'on stage,' an actor delivering his best performance. For once, clock-watching was only to keep on schedule so the show could go on."

"Overcoming community prejudice, and regaining the local market, justify the investment."

"Ole, what about that fortunate 'break' you mentioned?" Talmerage reminded him. "I'm curious."

Ole smiled. "The union gets in on this, too," he remarked. "Several days after the 'Family Day,' union officials made this offer:

"If the company would extend an invitation to the PTA, school teachers, and other groups, for a plant tour on a Saturday—the employees would work that day free. The company would stand all other costs, including relief labor and sample boxes of M&M's products, such as the workers' families had received on 'Family Day.'"

Talmerage sighed. "The things a big operation can do—the things they *do* do. Oh, how costly!"

"In business today," Ole commented, "many costs are relative. In the case of M&M's open houses, all the costs of the two tour days will soon be liquidated—if they haven't been already. Production continues well above average, and employee morale is the best it has ever been. Am I right, Batt?"

"It is now," Batt grudgingly conceded. "But will it last?"

Ole concluded the discussion: "Even if improved morale and production rate are not considered, overcoming community prejudice and regaining the local market justify the investment." —*End*

IVAN C. MILLER "Food Engineering"

Key Factors in Countering the PLs

SHARPER MARKET STRATEGY builds brand franchise for advertiser, sparks sales productivity for retailer.

IMPROVED TRADE RELATIONS pivot around mutual-help partnership between manufacturer and distributor.

FE Industry Analysis:

Brand Leaders Outline Steps

Most executives polled expect PL trend to grow . . . So they're accelerating drive to promote internal efficiency, improve trade relations, and keep ahead of changing buying habits and industry trends

POISED on the threshold of what promises to be another boom decade, food marketers find their planning complicated by these two big question marks: (1) Will the private-label squeeze get tighter? (2) What must be done to meet the challenge of distributor brands?

To get the answers, FE editors have been quizzing key marketing executives the past several months. Here's the gist of their findings:

Most food executives you talk to today see no letup in the PL trend in the near future. They point out, however, that the pattern will likely be one of sharp gains among certain product groups, partially offset by retreats in other areas.

Industry officials polled by FE see three factors sparking future PL growth.

A bakery executive traces it to the "continuation of concentration of purchasing power in fewer hands which makes PLs more possible." Also, he feels, "Economic environment has been such that firms using PLs have not, as yet, sustained losses on them, which they probably will under more competitive, and less favorable, economic conditions."

Other officials see PLs pushed into the forefront by internecine competition that dominates the retail field today. "As chain organizations get stronger," one cereals marketer reasons, "they will tend to increase their use of PL, not so much for extra profit as for extra prestige and exclusiveness." Or, as a canning official describes it, "The number of PL items will grow because the chains wish to offer something different from their competitors, and they also want to develop store loyalty through their own brands."

National advertisers, as well as independents, who co-pack for retail labels, are also seen contributing to bigger PL volume. One marketer bluntly states: "This trend is almost a sure one if manufacturers continue offering private brand merchandise at large price differentials under their own brand. I know of many big volume items being sold anywhere from 50 to 85¢ a case less than the manufacturer's own brand—although they all come from the same spout. You can't blame the big chains and other distributors for featuring their own labels under such circumstances."

Despite this, a minority of packers queried by FE see PLs being pushed back in the next few years.

One top-rank firm, challenging the idea that PLs have increased their share-of-market, reasons: "Chain stores make most of their profit on turnover. They stretch available capital to give them a maximum number of retail outlets through which they can sell the manufacturer's products, working basically on the manufacturer's funds.

"Tying up their own dollars in PLs reduces their turnover and real profit. The top chain executives who control financing realize this, and

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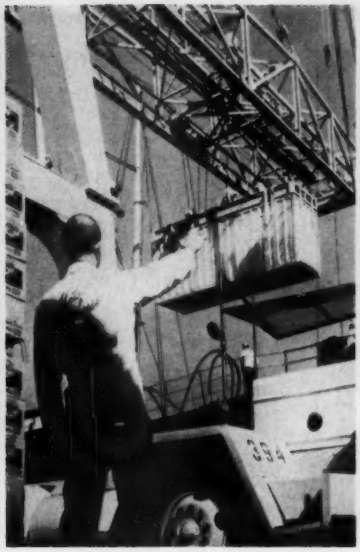
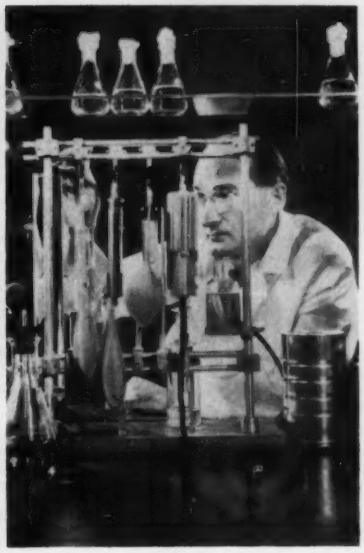


UPDATED DISTRIBUTION cuts costs, pares out-of-stock losses.



ACCELERATED NEW PRODUCTS, buyer-focused, strengthen profits.

to Meet Private-Label Challenge

they aren't going to let their buying or marketing departments get involved in PL deals that slow down capital turnover."

Another firm sees the PL tide slowed by "a definite trend toward concentration of manufacturing in stronger hands." This trend, the company adds, means that "fewer, stronger manufacturers can afford the research which ultimately will render present products obsolete. These same manufacturers will tend to refuse sales of the new items for PL use."

Still others feel that Washington, if only indirectly, will brake PLs' momentum. The current rash of Congressional investigations, and the long-range FTC economic inquiry, according to some observers, have already made the more astute retail combines temper their traditional bargaining-from-strength practices. And, the argument goes, the strong likelihood of some form of restrictive legislation is another deterrent.

In contrast with their divided opinions on the future scope of PLs, food leaders pretty well agree that the power concentration at the retail level will force more mergers among food manufacturers. Practically every executive checked by FE assumes that there will be far fewer manufacturers around five years from now.

At least one executive, though, contends that mergers in the manufacturing end aren't likely to match the acquisition rate in the retail field. Because there is a greater similarity of operations among retailers than among processors, he says, it is a lot easier for a chain to digest the purchase of another retailer than it is for a manufacturer to diversify into a different type of product-market.

With these key factors setting the stage for your own market planning, what can you do to offset—or adjust to—this PL squeeze?

Self-defense, like charity, must begin at home. Taking this tack, alert food firms are making drastic overhauls of their organizational structures and policies to cope with the PL challenge. Here are some of the more important steps that are being taken:

▶ **Integrated marketing:** More than any other, the food industry is a consumer-oriented one. The ultimate customer—Mrs. Housewife—still has the last word on whose brand will be bought, whose product will be used.

With consumers calling the tune, firms that want to stay ahead are regrouping their internal setups to put greater responsibility in the marketing man—whose job it is to anticipate consumer needs, develop new products, and plan sales strategy. For, in today's consumer-centered operation, the marketing executive now stands at the beginning and the end of the production cycle.

An implicit feature of this reorganizing is tighter coordination of different corporate departments. Too often a company has been crippled by disorganized planning whereby the brand manager of an advertised item did his best to boost sales, only to have another manager in charge of the firm's PL business push the sales of that same item at a substantially cheaper price.

An important aspect of the new marketing setups is the product (or brand) manager concept—which aims at strong marketing support for each product in a multi-item line. Thus, when Nestlé recently created three new marketing divisions—chocolate, coffee, and institutional—objective

"The manufacturer must advertise and merchandise more heavily in media more economically sound to him than to the distributor."–*Leading Canner.*

was to permit each division to concentrate on fewer products in greater depth.

Pet Milk's President Theodore R. Gamble calls his firm's new marketing division "The two-way bridge connecting company and customers." And he describes the division's basic responsibilities as: "(1) Defining, evaluating, and interpreting consumer and trade needs and desires; and (2) creating and activating marketing programs to stimulate demand, distribution, and sales."

▶**Planning:** Even the most scientifically organized marketing department will soon break up under the stresses of competitive cross-currents–unless there's a plan for the helmsman to steer by. Thus, you see more food firms meeting the PL-power play challenge with planning for both the long and short hauls.

Long-range guide lines are necessary to keep you ahead of the "scrambled merchandising" trends developing in the overall retail field–food stores going into nonfoods, department and drug stores retaliating with food departments, bantam stores making headway while giant supers rule the roost, smaller operators pooling their buying, and the entrance of new combines based on grower operations.

For day-to-day operations, greater stress is being placed on the annual marketing plan for each product group. Aim here is to acquire more maneuverability with which to combat local brush fires created by PLs and other competitive brands.

Flood Gets Bigger

▶**New products:** An essential part of any successful planning program is the development of more and more new products that meet, and even anticipate, ever-changing consumer buying habits. In fact, many observers look to new items as potentially the most successful counter to PLs, since house brands are usually imitators rather than innovators.

There are two developing trends that force the need for accelerated new product programs.

For one thing, the increasing variety of items going under PLs tends to cut down the profit pay-out period available to the developer of a new product. This means: (1) You have to plan on making your profit faster with new items, and (2) your rate of new product introduction has to be stepped up to stay ahead of competition.

Second, and of more long-range significance as retail groups fight harder to build a stronger image with consumers, you will probably see them go in for more new product development on their own.

▶**Trade relations:** Until manufacturers operate their own stores, they must proceed on the basis that they are partners with retailers in that both want to make a profit from selling goods. In fact, improved trade relations offer one of the most promising fields where the manufacturer can make headway against PLs.

Recognizing this, forward-looking firms are centralizing such activities under a trade relations director–a post you will see more companies create in the future. This development reflects a growing awareness by manufacturers of the necessity to help the retailer solve his two most critical problems–bigger profits and greater sales productivity.

Objective here is to make it profitable for the retailer to do business with the manufacturer. That is the thinking behind General Foods' new sales-service program, which begins with a detailed analysis of the problems of retailers and wholesalers in a specific area, and provides a plan that is custom-tailored to the distributor's requirements (see FE June, p.48).

▶**Distribution:** Routing of goods from plant to store is being revamped to fit retailers' needs, thus promoting better trade relations. Typical of the bold steps taken here is Pillsbury's new decentralized, strategically placed regional service centers that process orders faster, speed goods to customer to reduce out-of-stocks, and link inventory control with production planning–all at the lowest possible cost (see FE Jan., p.52).

Putting distribution on a more efficient basis is a primary need because it is here that observers see a critical source of the widening price spread between advertised and private brands. This is especially true in the case of perishables, such as dairy and bakery items, where size of drop-offs gives a decided cost advantage to the retailer who makes larger deliveries to his own stores compared to the manufacturer who must leave smaller orders on a more frequent basis.

▶**Strategic plant locations:** An important factor in cutting distribution costs is the trend to decentralize manufacturing operations. Many companies are gaining significant product cost advantage by building new production facilities in important market areas to reduce shipping distances.

Sharper Focus Needed

▶**Market strategy:** Noting the success retailers and wholesalers have achieved in building house brands in their own market areas, manufacturers are now switching the emphasis from national marketing to regional marketing. This change has been spurred by population shifts, growing recognition of the different competitive patterns of each marketing area, and the fact that a given product's popularity can differ sharply from one area to the next.

Making ad dollars work harder is looked upon as essential for offsetting the inroads of PLs. But this means more than bigger outlays.

Closer coordination between advertising and selling is one objective –as typified by Quaker Oats' new marketing organization. Specialized product managers in the advertising and sales departments, working together under group merchandising managers, coordinate headquarters and field activities, develop stronger marketing programs that score with distributors, and pool talents when tackling marketing problems.

Cooperative advertising, often called the "sugar daddy" of PLs, is being sharply re-evaluated by manufacturers. The 1-line "obit" mentions in food-day ads, and the differential between national and local line rates which favor retailers, are forcing brand marketers to replace the traditional co-op ad contract with mutual-service arrangements that give the manufacturer the product support he requires and the retailer the merchandising help he needs.

Some firms that favor junking the co-op arrangement entirely argue that what's needed here is more ingenuity in the use of merchandising dollars. As one canning marketing

CIRCLE 55 ON READER SERVICE CARD→

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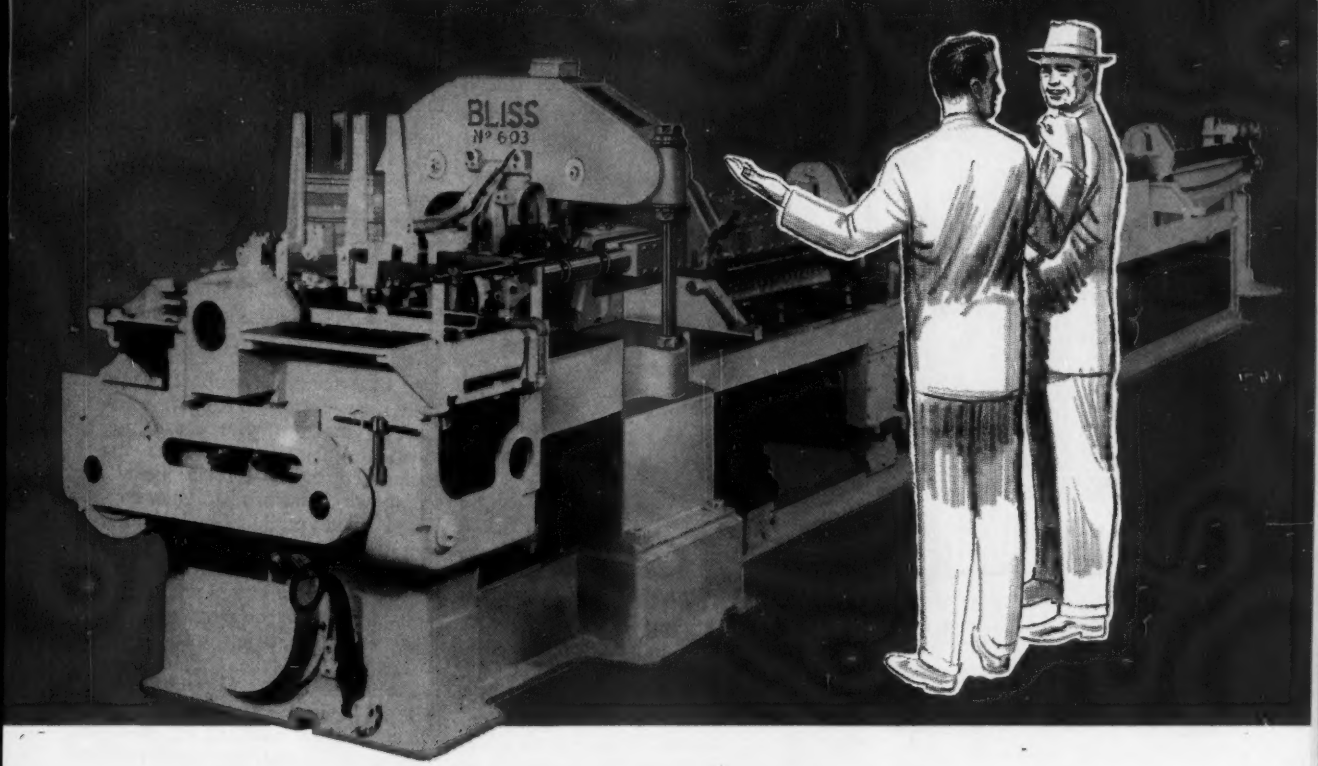

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vice-president tells FE: "We must advertise and merchandise more heavily in media which is more economically sound to us than to the distributor. Because the manufacturer can be in all outlets in a given market, his advertising dollar placed outside the distributor's ad will get more mileage. In other words, we should spend less on cooperative advertising and more on media of our own choosing."

▶**Sales management:** Control of selling costs and reorientation of salesmen are being used to minimize the price spread between advertised brands and PLs as well as solidify manufacturer-distributor relations.

In the first instance, firms like Calpak (see FE Jan. '58, p.62) use data processing programs to give management a fast, detailed sales analysis that spotlights strong and weak areas. Also, as a result of the speedy flow of more precise information, company planners can chart sales targets more effectively.

The growing sophistication of chain buyers, the developing trend by retailers to originate more in-store merchandising on their own and the importance of improving communications between manufacturer and distributor—all these call for a new breed of salesmen. In place of yesterday's order takers, manufacturers' field men today must be equipped with broader skills—ready to help distributors plan and carry out profit-building marketing programs, turn up solutions to retailers' particular problems, provide creative ideas for effective in-store displays, and spell out mathematically the turnover and profit facts on advertised brands.

▶**Packaging:** Here, too, is an area where upgrading by retailers has put new pressures on manufacturers. Time was when PL packaging was a pretty sad affair, but the more progressive chains have taken steps to correct this.

Meanwhile, manufacturers are learning that, while their own packaging in the past contributed to the success of self-service stores, in the future it will have to do more toward building a brand franchise. Thus, you will see advertising and packaging working together more effectively—the one to incite the desire to buy, the other to clinch the decision to buy. This means brand names will get a stronger play in package design, and that new products will have to be matched by containers that are easier for home use and display.

▶**Co-packing:** For some firms—brand marketers and otherwise—PLs can represent a kind of plus-business that takes care of excess capacity. And while the enroachments of the PLs have cast a shadow over this practice, the economics of the situation indicate that there will always be some kind of co-packing.

As one meat company executive put it: "A reputable food manufacturer has a definite place and reason for taking on some PL business on the right basis. If he prices his product intelligently, rather than giving it away, he can help increase the total profit picture.

"There are, certainly, efficiencies that result from the greater volume that can accrue to a national brand maker who has large volume facilities. What has happened in a good many instances is that the manufacturer has been willing to take on a PL at a loss and try to balance it off with his profit on the national brand."

Just how far some manufacturers have let the sirens of PL business lull them to the booby-trap of hidden costs is evidenced in this anecdote by a national brand executive: "We were recently looking at a new business that we were considering buying. When I looked over the owner's customers, I found he was selling two chains in a particular market a food product under their own labels at a difference of about 75¢ a case. When I asked him how he could make money at such a big differential, his comment was, 'I think I can make a few cents a case, and if I don't take the business, someone else will.'"

This official adds pointedly: "Manufacturers who sell PL at unrealistic differentials are simply holding an umbrella over the competitor of the nationally advertised brand."

However, there is a growing awareness, as indicated by GMA's current survey, that not all true costs of a company's business are being applied to the pricing of PL items. The feeling here is that once all the costing elements in a manufacturer's overall operation—including research, promotion, and advertising of his own brand—are reflected in PL prices, the spread will be considerably narrowed, giving advertised brands a better chance to compete.

▶**Efficient factories:** In the last analysis, processing and packaging are the prime operations of the manufacturer. Chains, on the other hand, are basically merchandisers. This should give the alert manufacturer an edge in production efficiency.

—FE Staff

Appreciation is expressed to California Packing for photos on p. 53 and left side of p. 52, and to General Foods for photo on right side of p. 52.—FE Staff

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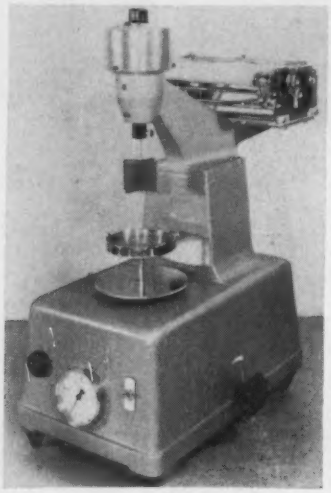

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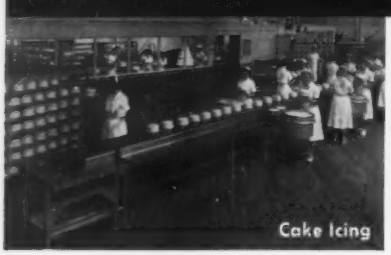
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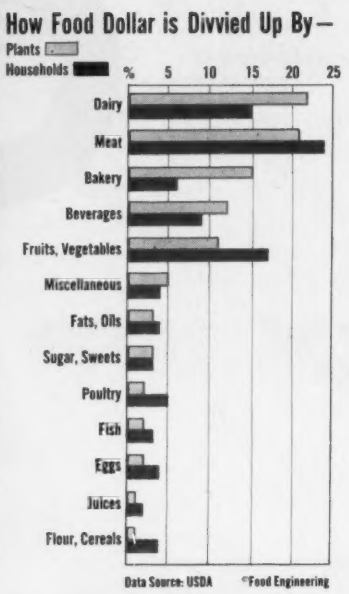


EXPENDITURE PATTERNS differ between factory and home. As bar chart shows, in-plant meal planner devotes larger share of budget to dairy items, baked goods, and beverages—but less to meats, and fruits and vegetables.

Factory 'Dining' Perks

On-the-job meals have rocketed into a quarter-billion dollar business—with food-beverage firms setting a fast pace among industries providing these services. . . This roundup reveals what products have strongest pull

IN-PLANT FEEDING for employees in the larger U. S. manufacturing plants has burgeoned into a $260 million market of foods and beverages.

And the food and beverage manufacturing industry itself is in the forefront in providing such services for its workers.

These facts are brought out in USDA's Marketing Research Div. study of cafeteria, restaurant, snack bar, and other types of food services in factories of all kinds. The survey concentrated on plants with at least 250 employees, to cover the most important part of the market.

Of the food and beverage manufacturing plants checked in the study, nearly two-thirds provide food service of one kind or another for their employees. This is higher than the average for all manufacturing establishments studied, in which slightly more than half offer such meal help.

What's more, food and beverage manufacturers show confidence in their own field: Nearly three-fourths of the firms with meal service operate their own departments for their employees. Whereas in all the industries studied, only about one-third of the companies with food service handle their own installations; the rest have them run on outside contracts.

Two-Thirds Benefit

AMS marketing researchers estimate that in January 1956 about 6,000 manufacturing plants of all kinds with 250 or more employees had food services (aside from vending machines).

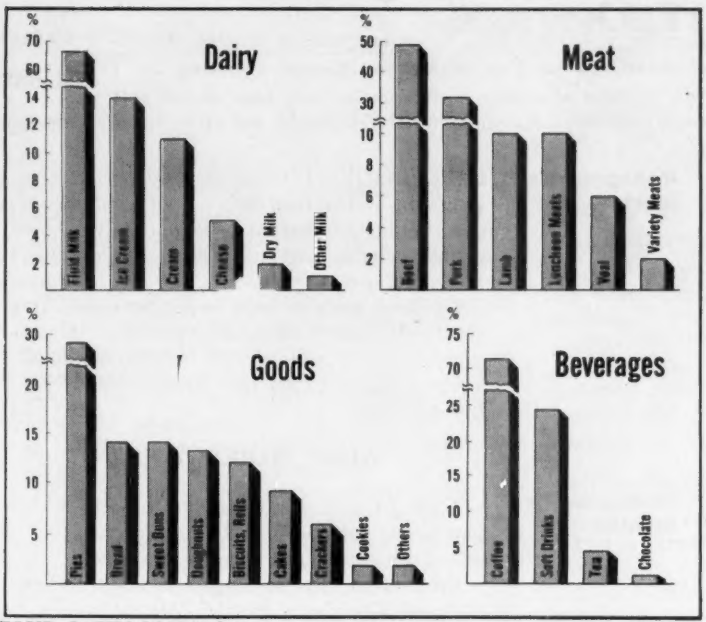
Just about all of the firms offer noon meals, and about two-thirds are open during two or more meal periods. Nearly three-fourths have facilities for coffee breaks; in addition, 9 out of 10 have vending machines.

Cafeterias are by far the most common type of service outlet. They outnumber, by a large margin, food carts, restaurants with table service, or such other installations as canteens or lunch counters.

Though a large share of these in-plant food services are company-subsidized to some extent, most executives feel that, given a chance to reconsider installing food services, they would do so again.

In some cases, especially where the company runs the service, the subsidy is in the form of a direct cash

ESTHER HOCHSTIM and ROSALIND C. LIFQUIST
Marketing Research Div., Agricultural Marketing Service, USDA.



FOUR CATEGORIES—dairy, meat, baked goods, beverages—account for 70% of factory food-service expenditure. Here's breakdown of spending dollar among component products of each classification.

Away-From-Home Sales

payment that makes up the difference between costs and income. Other firms simply don't charge for such operating expenses as rent, utilities, and maintenance.

Company executives consider the meal service as an employee benefit, the chief asset being its effect as a morale builder. More specifically, they think that food services provide healthful and less expensive meals and offer employees an opportunity to get together socially.

Production gains, too, get a wide mention, as do better labor-management relations. Help in recruiting personnel is cited as another virtue.

About two-fifths of the executives interviewed say they would do some things differently if they were to set up such facilities again. Apparently the most common errors are in physical arrangement of facilities and in starting too small.

Out of every dollar spent for in-plant feeding, 27¢ goes for meat, poultry, fish, and eggs—meat alone accounting for 21¢. Dairy products (excluding butter) take 22¢, while 12¢ goes for fruit and vegetables (including juices), 16¢ for cereals and bakery products, 12¢ for beverages, and 11¢ for fats, oils, sugar, and so forth (figures do not include items sold through vending machines).

This breakdown of the in-plant food dollar doesn't follow the pattern that holds true in household expenditures (see bar chart). For example, factories tend to spend a larger share of their food dollar for dairy, bakery products, and beverages, but a smaller share for main dish items like meat, poultry, and fish, eggs, legumes, fruits and vegetables, and fats and oils.

Food processors play an important role in supplying products to this market. And here, most food bought requires some further preparation. Some of this involves "readying" food—cutting up meat, cleaning and grading eggs, or sorting and cleaning vegetables and fruit.

On the other hand, more than half of the money goes for prior-processed foods. Expenditures for such items accounted for about $11.5 million during the 4-week (Dec.-Jan.) survey period.

At the same time, nearly 60% of the money laid out for vegetables (other than potatoes) went for canned and frozen products. Among canned products, half the outlay was accounted for by tomatoes, string beans, green peas, and corn. About 36% went for fresh vegetables.

Processed products represent even a larger share of the outlay for fruit, with 74% of the "fruit dollar" going for canned and frozen products. Dried fruit takes another 4%, and fresh fruit 22%.

Bakery products also represent considerable processing. These take 16% out of every dollar spent for food. Only 2 out of every 5 of the plants with food service regularly produce a portion of their own baked products.

Some food services purchase all their needs. Nine out of every 10 plants buy bread, 7 out of 10 buy pies and rolls, and at least half purchase cakes, sweet rolls, and doughnuts.

Other foods used in smaller quantities call for prior-processing—as for example, canned meat, fish, soups, chili sauce, catsup, jellies, and jams.

As indicated earlier, as much money is spent for coffee, tea, and soft drinks as for fruits and vegetables. Coffee in mid-winter represents about 71¢ out of the beverage dollar, and soft drinks, 24¢.

The only large area to vary from this was the South, where expenditures for these two types of beverages are almost equally divided—51% for coffee, 46% for soft drinks.

Vending Also Studied

In addition to covering food-serving plants, the AMS study provides data on vending machines. About 9 out of 10 of all plants have vending machines, with food-serving plants somewhat more likely than others to provide the dispensers. However, it appears that non-serving plants that do vend have larger installations.

Beverages are more likely to be sold through vending machines than are hot soups, ice cream, pastries, or sandwiches. Among the beverages dispensed, soft drinks hold the lead. Coffee and milk are next.

At the time the survey was made, some plants were planning to add more vending machines. Most prominent among the kinds of machines to be added were coffee, milk, and soft-drink dispensers. —*End*

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Gets More Mileage From Ad Dollars

*From files of National Menu Census and National Consumer Panel of Market Research Corp. of America. Material is factually correct. Identities of products and companies have been masked to insure anonymity.—the Editor**

MARKETING CASE HISTORY OF MONTH

Management's problem

OUR PRODUCT is used as an additive in a popular luncheon and dinner dish. Because it can also be used in the preparation of various other dishes, we could probably expand sales by promoting these additional uses.

However, we also make two other products which are used primarily in food preparation. Hence, our problem is: Would sales of these items be affected adversely if we encouraged broader use of the additive product?

WHAT WOULD YOU DO?

Management's decision

To find the answer, we sought to uncover both the *purchasing patterns* and the food *preparation methods* of the people who buy our products.

Information on purchases was available from the National Consumer Panel. We ordered a breakdown of families buying the additive, so that we could establish the characteristics of "heavy" and "light" buyers.

Having made this distinction, we next wanted to learn how each of these groups actually used the product. For those facts, we turned to the National Menu Census, a year-long study by MRCA.

The Menu Census indicated that "heavy" buyers used the additive in the customary ways, and also utilized it in the preparation of additional menu items. "Light" buyers, on the other hand, restricted themselves mainly to the routine uses.

We could now close in on a pivotal question: Do "heavy" and "light" buyers of the additive differ significantly in their purchases of our other two products?

By going back to National Consumer Panel records, we learned that "heavy" purchasers of the additive, who also used it in preparing diverse dishes, did not buy lesser quantities of our other two items than did the "light" buyers.

Result of action

It appeared, therefore, that sales of the preparation products did not suffer as a result of a family's expanded usage of the additive. Home usage of the products was complementary, not competitive.

Thus we could safely promote the extra applications of the additive. We could attempt to convert "light" buyers into "heavy" ones without fear that this would reduce the purchases of other items.

These findings also suggested an important revision in our advertising approach. Previously, we conducted separate campaigns for the additive and the food-preparation brands.

Inasmuch as there appeared to be little direct "competition" among them, it was logical to advertise them jointly as companion items.

*For more information, write to FOOD ENGINEERING, 330 W. 42nd St., New York City 36.

More Retailer Aid by Manufacturers

Grocery firms are stepping up the pace of their programs to help distributors solve critical operating problems. Last month saw these significant steps:

Campbell hopes to free retailers from price marking by coding tomato soup tins with "TOM" lettering on can end and grouping other soups in two price classes—vegetable types in lower price category, meat types in higher one. General Mills now allows distributors an extra 30 days' time to qualify for 2% cash discount on price and premium package deals, thus freeing vendors from duplicate capital investment. And Ralston-Purina's company and broker salesmen now reimburse retailers up to $10 for coupon redemption, promotional allowances, and damaged merchandise claims.

Back drop to all three moves is growing effort by manufacturers and distributors to solve vexing trade problems in a cooperative spirit. As a Campbell spokesman notes: "Finding ways to reduce costs and protect profits has created a major challenge."

Supers Boom in Britain, Too

Self-service stores (1958 volume: $952 million) now account for 15% to 16% of Great Britain's grocery volume vs. only 1.4% in '50 and 10% in '57. Also, the number of such units has skyrocketed—from less than 500 in '50 to more than 5,000 today, reports London's Board of Trade.

Cooperative societies, the first to push self-service in the British Isles, have 2,000 supermarkets out of a total of 13,000 outlets. And chains with 10 or more branches have 800 self-service units out of 10,000 stores—but those 800 do 10% of overall chain volume.

Regions Show Own Buying Patterns

One reason why regional marketing is becoming more important today is shown by a new Pan-American Coffee Bureau consumption study of the popular beverage.

Canned product, for example, makes up 75% of household purchases in North Central States and 90% in Pacific-Mountain area. But bags siphon off more than half of sales in Northeast and Southern sectors.

Trend in container sizes shows similar variation. Housewives favor 1-lb. units in Northeast and South, the 2-lb. package in the West.

Food Ads Bloom on TV

Television still has tremendous allure to food and beverage marketers. Grocery product firms upped their gross time billings in the medium 24.4% during the first half of '59, reports Television Bureau of Advertising.

Spot expenditures climbed 36.9% to $89.8 million, and network investment edged up 9.6% to $58.2 million. Top 10 TV food advertisers and their billings: General Foods ($10.2 million), General Mills ($6.0), Standard Brands ($3.7), Nabisco ($3.2), Kellogg ($3.0), Lever Bros. ($2.7), Pillsbury ($2.5), National Dairy ($2.5), Campbell ($2.4), and P&G ($2.2).

That Urge to Merge

Minute Maid, whose first attempt four years ago at expansion beyond its frozen orange juice base panned out badly, hopefully sees better things coming from its second try—acquisition of Tenco, soluble coffee producer (volume: $35 million). Company says step was logical one because of technical similarity of manufacturing process for frozen orange concentrate and instant coffee—namely, cooking at low temperatures in a high vacuum.

Selling the Fair Sex

Premiums will do their sales-stimulating job better if they're specifically slanted to the woman buyer, contends Janet Wolff, v.-p. of J. Walter Thompson and author of "What Makes Women Buy." Addressing last month's annual meeting of the Premium Advertising Conference, she listed these merchandising tips:

1) Emphasize the premium's good value. 2) Include a new twist. 3) Don't mislead. 4) Sell the woman's senses—let her see, touch, or try out the premium. 5) Build special details into it. 6) Use an emotional, romantic pitch. 7) Give it mass and individual appeal at the same time. 8) Point out ultimate family benefits. 9) Offer the woman a creative outlet. 10) Indicate the specific uses. 11) Give her know-how aid in running the house. 12) Provide for added quality and status. 13) Make the presentation more sophisticated.

BRIEFS

Switch to brand manager concept keynotes internal merger of Corn Products-Best Foods ad departments. Responsibility for firm's consumer items now rests with four ad managers.

Consumer reactions to premiums will be targeted in forthcoming survey by Premium Advertising Assn. of America.

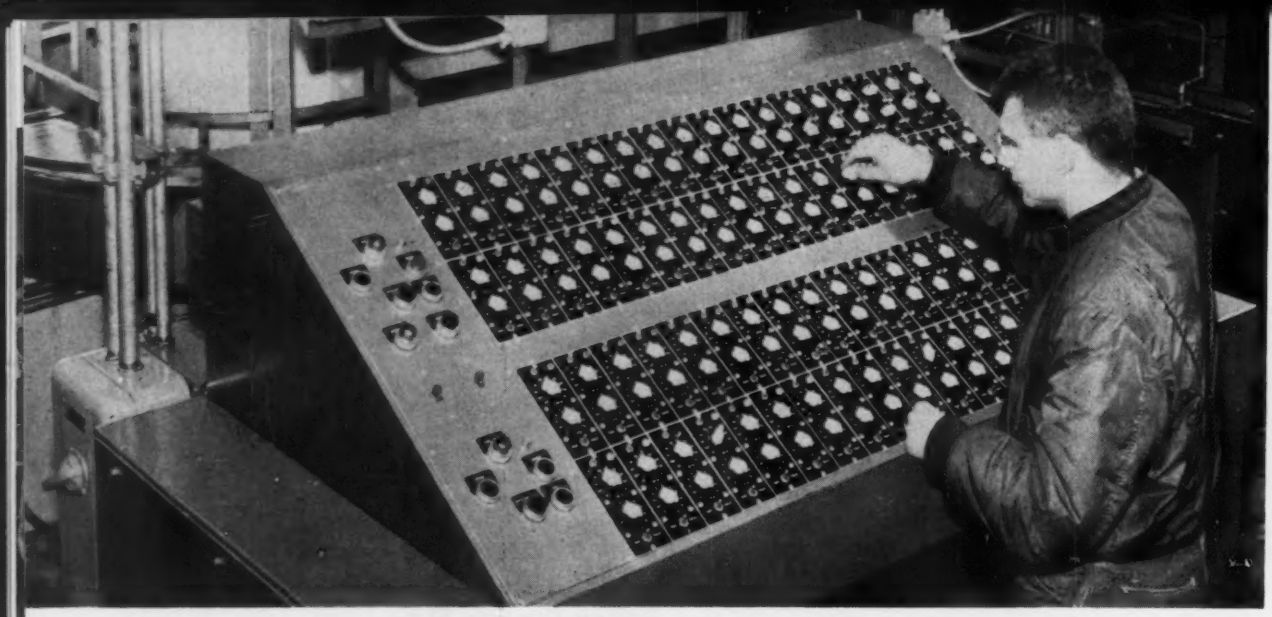
Moving to expand overseas sales, Dole opened first sales office for continental Europe and United Kingdom, in Zurich. San Jose headquarters still handles other export markets.

Menu variety will theme special Lenten promotion (Mar. 2-Apr. 27) by National Fisheries Institute as result of successful fall season Fish 'n Seafood Weeks.

Long-range drive for women's market by Ruppert Brewery now pivots on headwear created by top milliner, Mr. John, for use in company promotions. Style is patterned after tricorn worn by firm's Father Knickerbocker trade model.

Oversize packages risk retailer's disfavor in newly developed trend to bantam stores, warns Alan Berni & Associates, designers.

Promoting canberries on year-round basis, rather than just for holidays, has paid off for Ocean Spray. Firm says '59 crop was completely booked 30 days before start of harvesting.



CONSOLE operator flips dials to release cased goods from any of 72 order-picking conveyors.

FE Packaging Report:

New Handling Techniques End

Versatile "do more" machines now empty, pack, seal, and transport, taking load off workers and boosting productivity. . . And continuous-motion systems, such as described here, put routines on road to new speeds, lower costs

TODAY'S CASE - HANDLING units are making monitors, instead of laborers, out of production-line personnel.

Major force pushing this mechanization is, of course, the need for more efficient control facilities to boost productivity man-hours and slash unit costs. Hence, smoother, continuous-motion machines and fully coordinated systems from end of packaging lines right through to shipping dock—without a break—are showing up at an ever accelerating pace.

At one end of the line, machines lift cases of empties from incoming freight cars, dump them, and unscramble containers just ahead of the filling station. At the other end, they case-pack filled containers, seal the cartons, then whisk them onto the freight car.

Faster operations and multiple case-handling are forcing adoption of electronic control systems and lower tolerances on "shippers" (through tighter incoming materials' inspection and control). And standardizing cases, sizes, and flap design will simplify adjustments of case handling equipment in warehousing operations.

Also winning favor are new types of equipment directed toward replacing reciprocal, cam-operated, start-stop, package-pounding casers with those of the continuous, speedier, non-stop types. Cartons are fed into these new machines at a constant motion that's maintained throughout.

Outstanding Trends

A major development in non-stop case handling is the use of accumulators. Here, gravity-feed conveyors are racked one above the other to store packed goods and use warehouse floor space more efficiently. This provides output reserves to handle capacity differences between various stations and, in some instances, to stock backlogs in event of line stoppage.

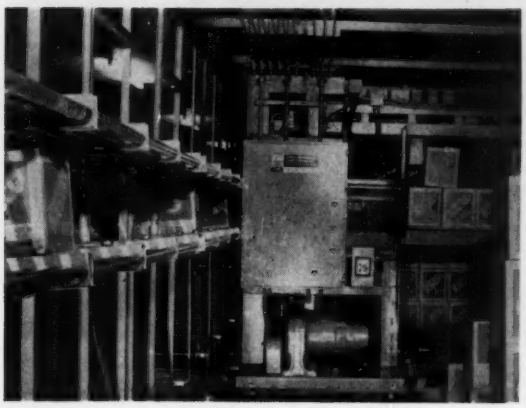
Another key trend is system engineering—moving cased goods into storage, recording number of each item on hand, and filling orders for shipment. Here, automatic controls promise substantial improvements in efficiency and reduction of manual labor. So much so, that economical justification of large investment in automatic case-handling systems—even to isolated cases of computer-controlled layouts—is getting a big play from industry leaders.

A typical sophisticated setup involves a console, operating on electrical impulse system, to electric eye-count case-lot orders and move them for shipment to accumulating conveyors. Specifically, multiple conveyor-feed lines (each loaded with different cased goods)—half of each feeding from opposite directions—monitor cases to accumulators that, in turn, feed onto take-away belt.

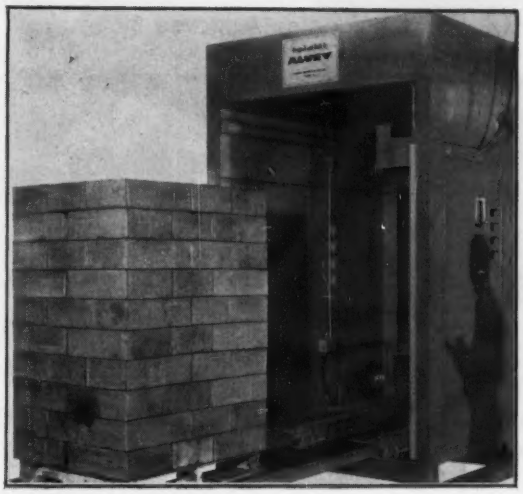
Console operator simply scans order, and pushbutton-programs number of cases needed from feed

JOHN V. ZIEMBA
Associate Editor, "Food Engineering"

Two Ways to Better Pallet Handling



DEPALLETIZER transfers case loads from live storage (right) to order-picking racks (left).



LOADER automatically stacks filled cartons in pre-established quantity and pattern for faster routing.

'Shipper' Bottlenecks

lines. Programmed units proceed to accumulators, past marking stations, and onto shipping dock at speeds up to 400 (digits)/min.

Totalizing dials indicate number of cases scheduled for each order, and flash warning lights when there aren't enough boxes to make up the order. Overshoot light comes on when there are too many.

Handling shippers on packaging lines and at warehouse level are two different stories. But for maximum benefits, you have to tie them together with a common thread of continuous, straight-through performance.

Newer Case Handlers

At the packaging-line level, emphasis is on more efficient in-sequence in-plant handling of shipping cases–at start and through end of packaging line. Here's what is being done at the head of the line:

Automatic depalletizer removes empty bottles from pallets for single-file delivery to automatic uncaser at speeds up to 25/min. (300).

Case unloaders. Three integrated units–flap opener, feeder, and unloader–curb glass damage on 600/min. line. Hydraulic motors, remotely powered by hydraulic pump, provide smooth, synchronized acceleration.

Air-actuated squeeze rails control flow of boxes to flap opener. Guide-bar section of reject mechanism, equipped with limit switch, spring-loaded bars, and pneumatic valves, discard cases with unopen flaps or inverted jars. Expandable rubber fingers deposit jars onto single-filer feeding washer as empty cases drop onto take-away belt (301).

Uncasers–one for brewer's flat- or crown-top steel or aluminum cans as well as "steinie" bottles, and another for all can and bottle sizes, handle up to 50/min. Both direct flap-opened, loaded boxes under plow and convey them upward. After cartons are inverted, spring-mounted vibrator contacts case bottom and deposits empty containers upright on belt feeding filler. (302)

Flap openers. Two-flap beer shipper, synchronized with opening mechanism, is elevated above latching device, then lowered for plow to raise flaps from one end as metal hook assists other. Opened cases proceed to discharge conveyor at 35/min. (303)

A similar unit plow-lifts top flaps of 4-flap cases, then hook-opens under flaps at 30/min. (304). Still another one pries up flaps on reusable beer cases at 30/min., saves 50% operating costs (305).

A fourth machine delivers 1,200 beer cans/min. by opening flaps and dropping cans on unscrambler belt. Empty cases are then routed to loading station (306).

Carton formers are highly mechanized, too. To wit:

Automatic case-handler automatically forms knocked-down cases, positions them over packing funnel, and feeds them to gluer-compression unit (307).

Multi-duty caser has four operations–opening, forming, filling, and sealing–accomplished by a single, pneumatically-operated unit (308).

Another multi-function machine forms, positions, end-loads (thirty 1-lb. margarine cartons) and seals. Capable of handling output from ten margarine printing-wrapping-cartoning machines, unit has chopped off an estimated $55,000 for labor per single shift and uses 11% less corrugated board (309).

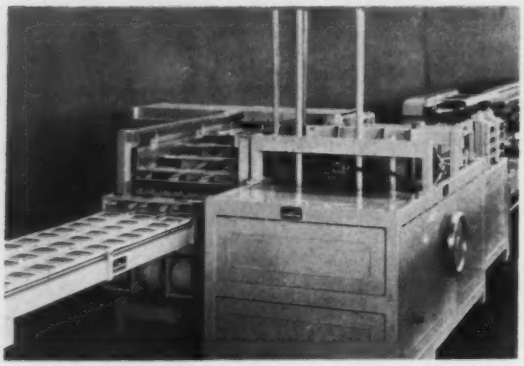
Still another opens, loads, and glue-seals cases. It packs 250 rice cartons/min. from fillers into end-loading shippers (310).

Set-up machine, for one-piece, knocked-down beer cases glues case bottom, double-stitches sides, and forms lids at 600/hr. (311).

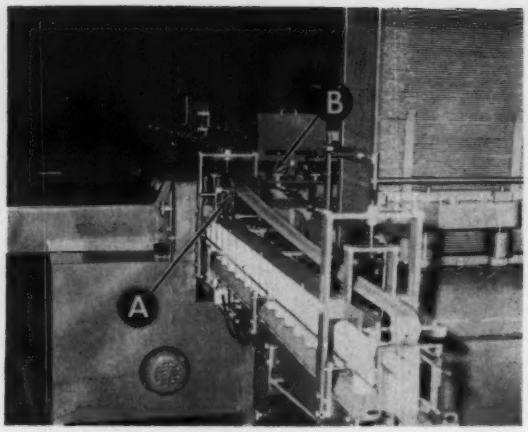
Operations are also being streamlined as packing and loading steps, as witness these efficiency-boosters:

In-case filler (gravity or vacuum) abolishes two production steps–removing empty bottles and repacking

Better Carton-Forming Achieved By . . .



MULTI-FUNCTION machine that shapes, positions, loads, and seals cases of packaged margarine.



CASE PACKER that automatically sets up, loads (A), and delivers to gluer-compression unit (B).

filled jars—by filling two or more cases simultaneously, depending upon number of bottles and filling spouts. And there's quick switch from one size bottle to another without need of extra changeover parts (312).

End-loading caser handles 24/12 oz. can cartons at 700/cpm. speed, affords 16-18% paperboard savings, and cuts labor costs and can damage. Knocked-down cases are fed to former, from which set-up boxes are positioned, end-loaded, sealed, and discharged (313).

Single-tier loader saves about 15% fiberboard, operates at 1,200-case/hr. clip. Upright handling of tins eliminates rolling can impact, torn labels, scratched lithography, can dents, and split seams (314).

Convertible packer loads eight 6-packs or 16 three-packs (carry-home catrons) of 12-oz cans into case. Unit up-ends loaded case for conventional sealing (315).

Similar installation (at Libby, McNeill & Libby) operates this way: Rail twisters turn 6-packs on sides as they drop to conveyor feeding caser. Two packs are raised by elevator bars as second tier moves underneath.

Double layer of packs are elevated to level of loading tube for pusher-plate shoving into case. Process is repeated for case-packing two patterns of 6-packs (total of eight 6-packs) (316).

Space-saving loader, adjustable to various size containers, guides empty cases to divider that separates them into packing lanes, each conveyed to load-forming grid and pusher guide. Cases are raised by spring-steel fingers and lift-table to packing position for loading, then lowered and fed onto discharge conveyor (317).

Aerosol packer simultaneously handles two cases at 240-cpm. rate from six parallel channels and gently lowers tins into cases to eliminate chipped and scratched container surfaces (318).

Electro-magnetic type loads 4 or 8 six-packs into case at better than 42/min. rate, is convertible for tray- or flap-type boxes. Rotating wheel brings pair of magnets to upper surface of double-row fed packs as they're positioned with cases. Carton-supporting trap-doors open to rotary position and load packs into cases that proceed onto gravity conveyor as magnets de-energize (319).

Gentle packer raises, instead of drops, glass containers into cases, thereby minimizes breakage, downtime, and operator attention. Speeds: Up to 30 cases/min. (320).

Carton packer comprises: (1) Feed conveyor to position and align cartons for proper assembly, (2) casing mechanism with elevator, assembly rack, pusher plate, loading tube, and case lowering unit, and (3) discharge belt to move packed cases to sealer (321).

For better product protection during transit, sealing and closing of shippers has been upgraded these key ways:

Case-sealer automatically groups and drops load onto conveyor platform that discharges filled cartons to gluer at 625/hr. (322). Another new unit inverts cases so their weight compresses glued top during transfer to storage (323).

Air-operated stapler. Side-seals cases (telescopic, partial- or full-overlap, and regular slotted). Staple is automatically driven each time case is pushed against trip bar. Height of stapling head is adjustable for different case sizes, can be rotated to apply staples vertically or horizontally (324).

Crushproof tape sealer, designed for corrugated shippers containing fragile, lightweight packaged items such as potato chips. Machine indexes filled cases from gravity conveyor, folds flaps, and applies gummed tape. Tear-band attachment also affixes ½-in. band of string along center of glue line (325).

Self-measuring taping is done by fingers on elevator-mounted tape selector that measures correct tape length (including overlap) regardless of case size (326).

Machineless flap sealing is accomplished without glue, tape, or staples by preprinting cases with pressure-sensitive adhesive (327).

Automatic stitcher cuts stitches, formed from wire coil, and drives them into outer and inner flaps of filled cases (328).

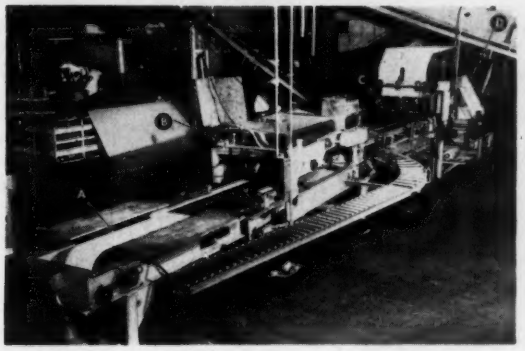
Fast assembly of finished goods is more efficient, less costly, using new machines and procedures. Here are some:

Pallet loader, handling up to 39 cases/min. via control panel, stacks uniform loads in pre-determined quantity and pattern (329).

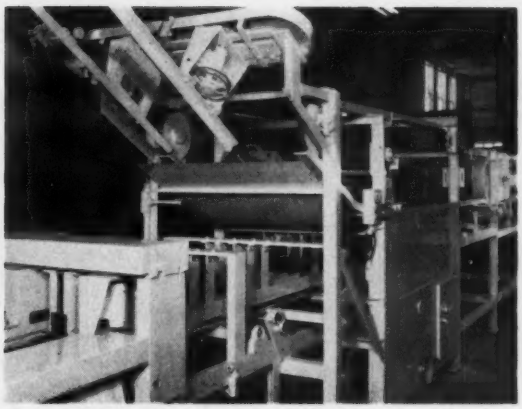
Reversible air-chain conveyor automatically loads or unloads palletized cased goods in or out of trailers. Driving force—the air-chain—glides along freely on air cushion (330).

Pressure-sensing conveyor has wheel conveyor with powered 4-in.

Glass Breakage Is Reduced With . . .



INTEGRATED line comprising case feeder (A), flap-opener (B), unpacker (C), and single-filer feeding washer (D).



GENTLE-HANDLING packer that raises, instead of drops, bottles into cases to curb shock impacts.

belt to minimize "slug-loading" and case "jack-knifing." Pressure-sensing properties result from effective system of trigger wheels linked with pressure wheels (331).

Palletless handling. Proctor & Gamble engineers devised hydraulic clamp mounted to lift-truck that handles, without pallets, up to 325 cases at a time. Clamp arms are adjustable for 20- to 70-in. widths, have large, non-crushing contact area (332).

And even the "quality control" aspects of master cartons haven't been overlooked by automatic equipment. For example:

Case cleaner automatically inverts, air-blasts, vibrates, and delivers right-side up (free of caps, broken glass, etc.) flap- or open-style returnable cartons at speeds up to 38/min. Unit also has insecticide spray device (333).

Washer and sanitizer subjects non-skid, plastic-coated returnables to vibration, air blow-out, and detergent wash. Cases are then inverted for brush-wash (sides, flaps, and bottom), rinse, and air blow (334).

Check weigher scales cases in 20- to 100-lb. range at 30/in. clip, passes correct-weight cartons to next station, and rejects over- and under-weight ones (335).

Code sampler counts out, ejects, and accumulates identified carton-packed samples for quality control lab's batch-checking of prepared mixes (336).

Then, there are the miscellaneous units which solve specific problems:

Case sorters. One segregator has mechanical fingers that measure length, width, and depth of shippers and shunts them onto parallel belts, each of which handles one size. Affords large savings in conveyor costs (337).

Another unit sorts according to size, weight, or classification via 3-way switch that dispatches cases into side aisles or straight ahead without use of deflectors. Switch is controlled by remote pushbuttons, limit switches, photoelectric cells, or other electrical means.

Series of classifications made through switches brings like cases into proper storage line. Automatic diversion to bypass line is achieved should main conveyor be blocked (338).

Bundling unit automatically applies paper or acetate tapes in varying colors and widths to double up 150 cases/hr. (339).

Piggy-backer glue-bonds two cases coming from sealer, thus increasing warehouse's live-storage capacity (340).

Bright can-unloader has electromagnetic pickup to unstack tins (600/in.) from pallet and single-file them to labeler (341).

Engineered Systems

It's a different story at the warehouse level, with the problem of handling cases—even mixed—solved many ways.

Perhaps the biggest ratio of output per man-hour in the food industry today stems from mechanized case-handling systems at the tail end of packaging lines—specifically, moving identified cases in and out of warehouse and shipping. In general, these systems cover dispatching, sensing, mechanized loading and unloading, and data logging.

Dispatch controls—ranging from pushbuttons to phone dials—direct incoming cases to proper storage area. More sophisticated, flexible dispatching features shift-registering—assigning each transfer station to a zone number and corresponding binary code signal.

Cases pass a dispatcher, who identifies and pushbutton-selects their route. Signal fed into shift-register maintains cases on "first-in, first-out" basis.

When shippers reach their first transfer point, signal is compared with transfer-point code, which cancels out if both correspond. Meanwhile, control searches ahead when signals don't match and unaccepted cases proceed to next transfer point for another comparison.

In similar electronic case-routing system, dispatcher pushbutton-codes (onto punch tape) cased-product identification and live storage location. Transfer-point control is programmed to accept or reject specific codes.

Unaccepted case's identifying code is punched on a second tape for another transfer-point comparison. Cycle repeats until last storage area reads out all codes relayed by preceding transfer stations.

Modifications involve use of magnetic tape or pre-selecting case-identification and storage-area codes that are punched onto tape for large production runs on a specific product. Former is continuous between printer and reader at each transfer station and is cleaned after reading.

Sensing systems operate similarly to dispatching, except for sensing case identification and eliminating control memorizing of identification-code signals. Cartons of varying sizes are mechanically or pohtoelectrically identified at transfer points. They're

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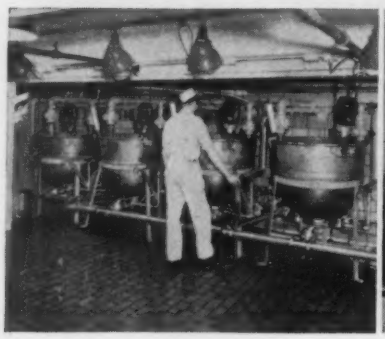
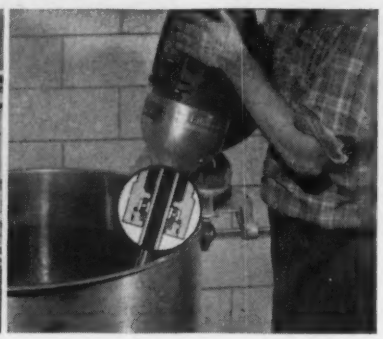
How to choose a portable mixer

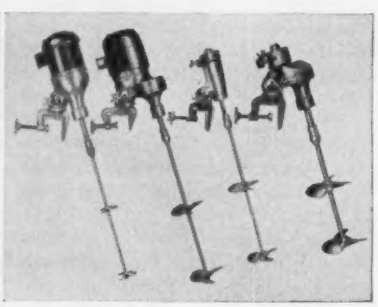
To get your money's worth, ask yourself these questions...





1. Will it mix my materials efficiently? Your mixer must set up just the right *balance* of fluid flow and turbulence for the result you want. You get this balance with a LIGHTNIN Portable Mixer. Selected by scientific methods, it's *guaranteed* to do the job right.

2. How is the shaft supported? Is the mixer built to protect the motor against the strain of radial shaft loads? You'll find this vital safeguard in LIGHTNIN Mixers. An extra ball bearing here steadies the shaft for true running—adds years to motor life.



3. What about adjustability? You can quickly swing a LIGHTNIN Portable to any angle for the exact kind of mixing you want—slow roll, vortex, or rapid top-to-bottom turnover. Universal ball-and-socket clamp tightens without wrenches—stays tight.

4. How much choice do I have? With LIGHTNIN Portables you can choose from *thirty* models, ⅛ to 3 HP. Direct or gear drive; electric or air motor. Shafts and propellers in all alloys and coverings. There's a LIGHTNIN Mixer to handle any job.

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even code-preprinted with magnetic ink for detection and identification upon passing warehouse's preprogrammed transfer-control station.

Manual loading and unloading are also being abolished through mechanized systems. To illustrate: Gravity-feed conveyors racked one above the other are loaded from transfer conveyor that's automatically emptied by electrical signal-accepting hydraulic or pneumatic lifts. Limit switch and numerical control systems position unloader at pre-selected locations, feed cases onto gravity-feed conveyors.

Dispatching or sensing systems also aid unloaders. Example: Cases are sensed for identifying code signal that's electrically compared with previously set up program to deliver them to proper storage. Since they're not identified during unloading from multi-tier storage conveyors, only take-way belts are needed for each one.

Automatic data-logging systems are tightening the inventorying of cased goods. Warehouse dispatcher simply punches case identification and storage location onto duplicate cards, retains one as other accompanies shippers into storage.

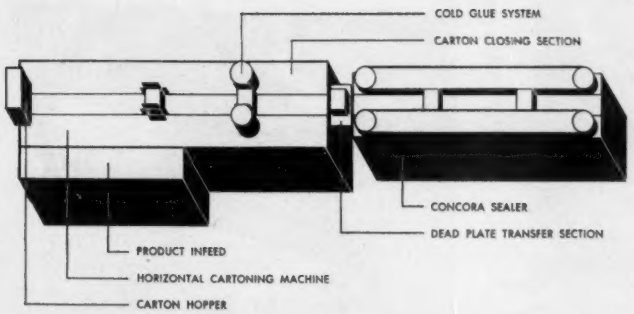
Dispatcher's cards are product sorted, totalized, and printed to record production. They're then searched to locate warehoused cased goods to fill specific orders.

Duplicate cards (accompanying cases into storage) are identified, removed, and printed out onto a shipping list. Order-selected cases are finally loaded into car or truck.

Adding card punch, sorter, and reader to dispatching system provides inventory, production, and shipping records. Sensing and dispatching systems do the same. One system calls for use of tape or magnetic ink-code method for storage. Inventory-recording electric typewriter picks up coded electric signal (identifying case).

A combination of sensing system and computer also inventories records. Sensor diverting coded cases into storage feeds signals into computer, which correlates information —cases in and out of storage—and provides the records. —*End*

Acknowledgment: The author expresses appreciation to the following for their assistance in preparation of this Special Report: R. Schoenfeld, Alvey Conveyor Mfg. Co., St. Louis; W. M. Parry, W. F. & John Barnes Co., Rockford, Ill.; R. L. Biggs, Bostitch, E. Greenwich, R. I.; J. Knight, J. L. Ferguson Co., Joliet, Ill.; C. E. Evans and D. E. Ryan, Food Machinery & Chemical Corp., San Jose, Calif.; R. R. Johns, Johns-Nigrelli-Johns, Chicago; K. B. Maatman, The Rapids-Standard Co., Inc., Grand Rapids, Mich.; F. J. Turner, RCA, Camden, N. J.; M. Salwasser, Salwasser Mfg. Co., Reedley, Calif.; and T. Grange, Stewart-Warner Corp., Chicago.



ONLY ONE OPERATOR is required on this combination feeder-sealer. After glue is applied in etched pattern and end-folds are tucked in, box travels through high-frequency field that gives fast set to adhesive.

Cuts Costs in Carton Sealing

New 'cold glue and high frequency' technique wins big savings in adhesive, equipment, labor, and reduced down-time

BETTER package protection at less cost is the twin-goal of every cost-pressed food maker. And that's what Pennsylvania Frosted Foods, Southhampton, Pa., is achieving with a new carton sealer that employs a cold adhesive (polyvinyl resin) and high-frequency radio waves.

The significant dollar savings, says the packer, come from:

. . . **Cheaper adhesive cost.** Cold glue now used has a 28.5¢/lb. price tag, as against 44-45¢/lb. for the previously used hot melt glue. A pound of the resin is good for 1,000 cartons—same as for the wax.

. . . **Smaller equipment outlay.** New sealer ($13,500) and carton feeder ($10,000) aggregate $23,500. In comparison, the combination feeder-sealer-overwrapper that was replaced cost $26,500.

. . . **Less manual labor.** New set-up is operated with one less worker on the packaging line.

. . . **Reduced down-time loss.** Jam-ups are reportedly fewer with the cold adhesive, resulting in fewer damaged cartons.

Key element in these savings is the new carton sealer, developed by Container Corp. of America in co-operation with Raybond Electronics. Pennsylvania FF uses the unit in conjunction with a Rex Packaging Machine carton feeder. Sealer is adaptable to other similar units.

Development work began two years ago when growing popularity of no-wrap cartons forced the need for (1) a cold adhesive that didn't require a solvent (which always runs the danger of passing into the product), and (2) a "gentle" sealing action that minimizes pressure on product-filled carton (see also FE Nov. '58, p. 64).

CCA says that development of the high-frequency technique opened the way for use of a solvent-less polyvinyl resin on heavily waxed end-flaps. Also, that the equipment works equally well with plain and waxed paperboard.

During the packaging operation, filled cartons go from feeder to sealer via a dead plate, then proceed along specially fabricated infeed belts through a 6-ft. electrode section and a 4-ft. compression area.

An electrostatic field—strength of which is inversely proportional to the distance between container and electrode bars—is developed by a stray-field type of electrode. As the cartons move along between the bars, the high-frequency waves melt the paraffin aside, letting the adhesive make a strong bond with the board fibers.

Package contents remain unheated because of their greater distance from the electrodes and somewhat limited exposure to the electrostatic field.

Running speed of the unit is 125/min. for Pennsylvania FF's 5-in. frozen fruit pies, and the firm says it has been able to go as high as 165/min. —*FE Staff*

There's Wear to Spare in . . .

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THE strength and durability of La Porte Galvanized Steel Conveyor Belts pay off in improved performance and lower maintenance cost. The flexible open-mesh design assures a positive drive on the La Porte Sprocket, allows the free circulation of air and liquids around products in process, also makes these belts easy to shorten, lengthen, repair, or sterilize without removal from the sprocket. In addition, the hard galvanized surface resists oils, acids, detergents, grease and corrosion.

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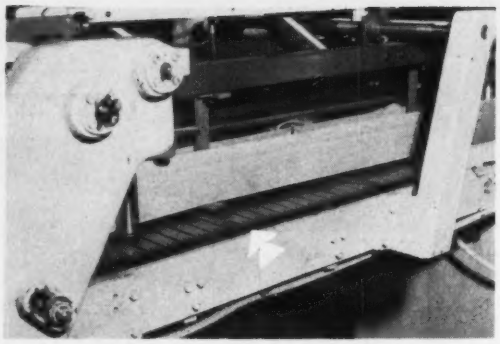
CIRCLE 69 ON READER SERVICE CARD

BIGGEST BREAKTHROUGH: Poly overwrappers have made their biggest dent in baked goods field, where their speeds (55-75/min.) approximate those of conventional cellophane and waxed-paper units. Seen here is new AMF line operating at General Baking plant.



CLOSEUP of AMF unit shows heat-sealing bars (arrow) which ride along with conveyed bread loaf from pick-up to loading table. Special tension arms move along with product, take up poly's stretchability.

Automatic Poly Overwrappers

New machines are geared to solve tech problems of cheapest film—bringing big bonus to packagers . . . Here's what units give you—speed, handling, costs

LOW COST and improved quality have long made polyethylene attractive as a possible overwrap for food packages. But the film's tricky nature has roadblocked efforts to adapt it to an automatic operation.

Of course, form-fill-seal units for bag-type containers have been available. Now, as the result of new machine features turned up by equipment makers, the day of automatic overwrapping with poly is much closer. New line units, specifically designed to accommodate the film, are being field-tested, and others are on their way.

Significantly, the upcoming poly overwrappers pack an extra big bonus—they'll also be capable of handling most of the other fast-coming thermoplastic films, makers report.

Here's a quick rundown on the new machines coming on scene—with details on speeds, handling features, and costs.

Up to now, development work has concentrated on the bakery field (which consumed, roughly, 3,000,000 lb. of poly in '58). Reason is that bread wrapping speeds are on the modest side—55 to 75 loaves/min.—because of product characteristics. This gives suppliers a reachable target.

Equipment firms are trying out a whole gamut of bakery items on prototype models. Battle Creek Packaging Machines, for example, reports that rolls and buns "do not pose any special difficulty." And Oliver Machinery has run cluster buns (frankfurter and wiener types) on its production model, also expects to "handle a full line of variety baked goods but not sliced bread."

Separate models for loaf bread and rolls have been developed by American Machine & Foundry. Interchangeable for both cellophane and waxed paper, the units are designed to give bakers added versatility.

Poly wrappers are also being readied to handle a wide range of other types of food products. For instance, Hudson-Sharp's Campbell model is getting an experimental try on a spaghetti and macaroni line.

The unit, installed at Skinner Manufacturing, reportedly enables the firm to get the same output, but with only one-third the personnel, required by a previous setup. Using unsupported poly, the machine handles all package sizes up to 16-oz.

Hudson-Sharp plans to adapt the overwrapper to two other fields—produce and baked goods. R. E. Jansing, district sales manager, feels the unit should work well for packing headed celery, as well as small cake and cookie items.

Cut-up poultry, red meats, and fruit and produce tray packs have been poly-wrapped on a new Crompton & Knowles unit.

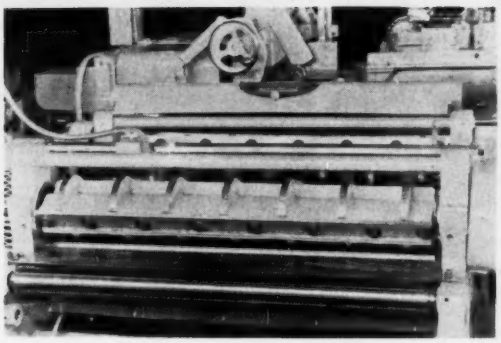
Some machine makers have reengineered older models to accommodate the film. Package Machinery says that modified units have successfully poly-wrapped bread, rolls, dry pea beans, marshmallows, candy, and potatoes. And Hayssen reports it has test-run poultry and baked goods (wiener and frankfurter rolls) with poly on redesigned equipment.

Speeds Are Modest

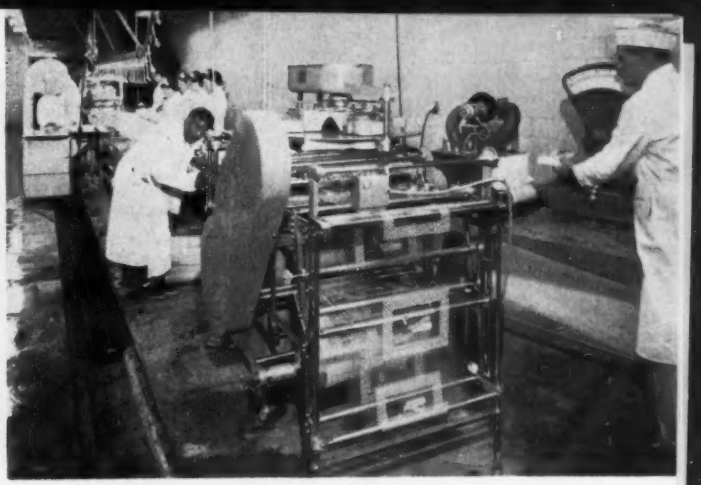
With equipment makers concentrating on licking technical problems, there's been no rush to build extra high speeds as yet. However, suppliers seem confident they can boost output rates as experience with the new units builds up, and sales demand increases.

Battle Creek claims a wrapping speed of 75/min. with its new unit, depending upon item and type of film used. AMF reports the same rate for its bread wrapper and a 50/min. clip for its combination bun and bread packager.

THAYER C. TAYLOR
Associate Editor, "Food Engineering"



EASY-OPENING of poly wraps is abetted by special attachment on Battle Creek unit which perforates film during pre-wrap stage. Electric eye setup registers scoring line at desired place on package.



NEW APPLICATIONS are opening up for poly wrappers outside baked goods sector. Here, Crompton & Knowles unit tray-packs poultry parts. Meat containers are another good prospect.

Now 'On Stream'

Hayssen's Sales Manager Fred Koehn says speeds on its modified lines "vary from 25 to 40/min., and there's a very good likelihood that this will be increased." Roughly the same rate is cited by Oliver's Sales Manager S. H. Massingham, who adds that "we can reach a 55-60/min. rate with smaller package sizes." Crompton & Knowles, too, places the output of its poly wrapper at around 45/min.

Machinability Enhanced

In designing automatic poly overwrapping equipment, suppliers have come up with new machinery features that answer the problems posed by the film's limpness, stretchability, and thermoplastic nature. As a result, sealing and handling have been greatly improved.

Sealing, always a critical matter with thermoplastic films, is being carried out in a variety of ways.

A "Thermo-Pad" technique used by Battle Creek is described thusly by V.-P. Keith Redner: "We travel the pads with the package in the sealing surfaces, and apply sufficient heat through the barrier of the pads to melt the film. Then we apply frost through the pads to reset the melted film to its normal condition —all without any disturbance to the folds, and all under continuous motion."

A timing mechanism on the AMF units spreads out the application of heat over a longer period of time to prevent the build up of blisters. Here, there's linkage with a refrigeration system for the end seals.

On its Campbell wrapper, Hudson-Sharp employs a hot-wire method for both the tubing and extended end seals. With some models, where completely air-tight protection is needed, the firm uses a continuous overhead chain device that applies heat to the seal through a controlled time impulse.

The procedure followed on the Oliver prototype is a continuous motion, belt-type system that provides both heat and cold to the bottom seal. Film is conveyed into the wrapping area by means of a belt over a vacuum chamber, thus assuring extra-tight seals.

"Bunch folds"—where all the film is gathered and sealed on the underside of the package—mark the Crompton & Knowles machine. A special heat-sealing unit consists of a series of radiant heated rolls over which the container travels after the wrapping has been sealed.

For its Transwrap equipment, Package Machinery employs a roller and belt (Fiberglas) contact system that's paired with an impulse type reciprocating hot bar to seal bottom folds. Thermostats provide closer heat control according to the type, density, and gage of the film that is used.

Solid Teflon or Teflon-coated parts are installed on Hayssen equipment, along with special shear assembly, to carry out the sealing process.

SEE UNITS AT SHOW

Much of the equipment described here will be seen at next month's Packaging Machinery Manufacturers Institute Show. The polywrap units will be one example of the intricate machines and multi-use packaging materials on display. Time and place: Nov. 17-20, New York City Coliseum.

Transporting the Film

Because of its limpness and stretchability, poly can't be pushed or pulled through overwrappers the same way stiffer materials (like cellophane or waxed paper) are on conventional units. Machinery makers have come up with a variety of means for transporting the film from cut-off to overwrap positions.

AMF, for example, has devised a series of spring-loaded tension "arms" that take up the film's stretch during the wrapping operation. Geared to the film's tension, the arms travel with the wrap from the loaf pick-up to the final sealing point.

A static eliminator, installed where the roll unwinds, helps out on the Battle Creek machine. Film is then "carried"—rather than driven—into position for wrapping.

Electronic controls, a positive type of film feed, and static eliminators carry off the trick for Hayssen's units. Special idler roll assemblies and feeding methods do the same on the Crompton & Knowles wrapper.

Package Machinery says feed con-

Performance was "gone with the wind"

till they installed Marley

DOUBLE-FLOW® AQUATOWERS

"These two 'little' towers give us capacity and temperature that make operation ideal," says Earl Smith, Chief Engineer of the world's largest milk processing plant. He's referring to two Marley Double-Flow Aquatowers that now occupy the same basin where a 40-foot atmospheric deck tower used to stand.

"When the Arden Farms plant in Los Angeles was built, its location was completely open," Mr. Smith adds, "but year by year, more and more industrial plants ringed us in and our water temperature rose accordingly. Under today's demanding production schedules, positive temperature of process cooling water is imperative, so the deck tower had to go."

Marley's Double-Flow Aquatower, industry's first choice for intermediate-capacity services, is only part of the complete Marley line of cooling towers that range from small packaged units for "spot" cooling to giant industrial towers. If outmoded or inadequate cooling towers are jeopardizing production in your plant—or if you are wasting water in even small quantities in some corner of your plant—call your Marley Application Engineer today. Without obligation, he'll make a professional survey of your water cooling requirements and show you, too, how to turn "hot spots" into "profit spots."

The Marley Company
Kansas City, Missouri

MARLEY

72 CIRCLE 72 ON READER SERVICE CARD

trols and style of fold have licked the handling problem on its modified models. Where a thinner gage may cause trouble, adds V.-P. E. W. Forth, "we probably would use air jets to support the film at critical locations."

There's a Difference

Of course, not all films handle alike on automatic machinery. Even in the poly family, machinability differs according to a film's density. But, while experimental efforts have been focused on the low density types, equipment men have worked hard to make their units perform with films whose densities range from .910 to .965.

Battle Creek says its new unit will handle low, medium, and high density poly. But, the company warns, "high density poly, which is more critical as to temperature and pressure, requires more uniform, dimensionally planned packages. That's because slight variations in dimensions represent important variations in pressure in relation to the particular material."

Package Machinery reports its models have handled poly from .932 density to as high as .960, while Crompton & Knowles states that it has successfully run low and medium density sheeting. Hudson-Sharp has test-run all the densities, but finds that "the lower density films operate faster and more efficiently" on its overwrappers.

Hayssen recommends the use of 1-mil film for its equipment, but adds that material up to 3-mil can be handled. And Oliver reports that its prototype has worked with film that is 1- to 4-mil.

Price Tag Spread

As can be expected, there's a wide range in machine costs, depending upon what you want and the job that has to be done. Roughly, prices fall between $12,000 and $24,000.

Hudson-Sharp's units cost from $12,000 to $18,000; Package Machinery, $15,000 to $24,000; and Battle Creek, $17,000 to $22,000. Oliver's poly wrapper, when it becomes available, is expected to go for $17,950, and AMF has a $17,150 price tag for its unit.

There's a range in waiting periods, too. Companies say that the wait between orders and shipment to customers is anywhere from 3 to 6 mo. —*End*

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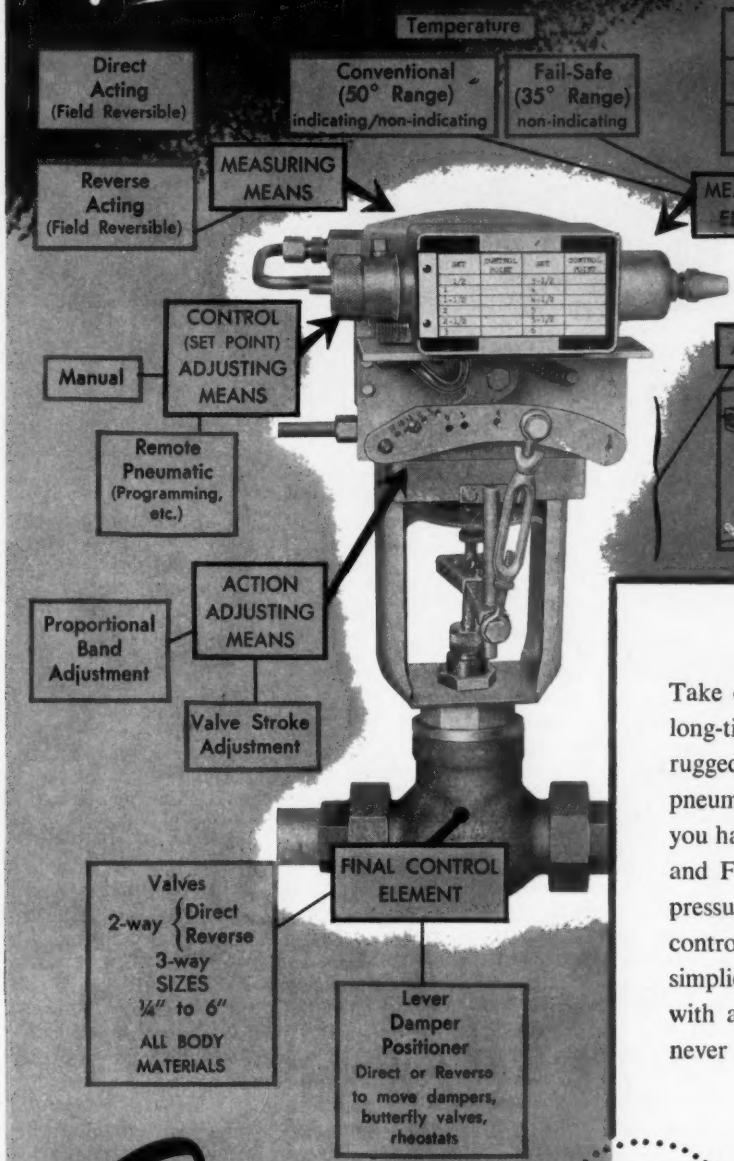

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GROWING LIST of food products offered in aluminum cans now includes these frozen whole strawberries, put up by Blue Lake Packers.

Now—Aluminum Cans for Frozens

Light-weight container gives frozen-berry item added use-convenience, and improved product protection

WHICH IS more important—cost or convenience?

Betting on the latter, Blue Lake Packers, Salem, Ore., is offering fancy-grade whole frozen strawberries in a new aluminum can—a step which marks another first for that type container.

Pres. Norman Merrill points out that housewives have long complained about the difficulty of opening the fiber-body, metal-end unit commonly used. While conceding that the new can costs 7½% more than the conventional package, he cites these key advantages:

▶ Container is simply opened with a can opener, whereas former unit required sometimes dangerous use of a knife.

▶ Hermetic sealing prevents quality degradation, which sometimes results from dehydration while product is under refrigerated storage.

▶ Size-graded berries retain their original plump conformity, texture, and flavor, and both berries and heavy syrup in which they are packed keep their original brilliant color.

▶ There's a significant saving in shipping weight—about 1-lb. per case (some 4% of total case weight).

▶ Defrosting in the home is quicker. New container can be quickly thawed —in 20-25 min.—by placing it under cold water tap (warm water not recommended, since it effects quality of product).

The distinctive can provides a brilliant surface for the 7-color lithographed design. The label is continuous—not broken by a solder margin—since the can is cemented on the side seam.

Quality retention of frozen fruits in tin cans is a matter of record, says Merrill. Years ago, successful packs (various fruits, berries, and melon balls) were put up in the square 'asparagus-type' can.

This new 1-lb. container (303x 460) is fabricated of aluminum with ends of 11/1000-in. and body of 10/1000-in. Both ends are double-seamed, same as in tin cans.

The container (Continental Can) weighs about ⅓ as much as identical-size tin can. The cans stack easily in store cabinets, and require little more space than some of the rounded-edge rectangular cartons used for frozen fruits. And because they nest together, new cans aren't so susceptible to disarrangement.

Background color of the label is pink, against which the vignette, of three dark red strawberries with green cap stems, is in harmonious, though striking, contrast. The brand name, "Oregon's Finest," and the other label copy, which appears in two places on the can, are in red and two shades of blue on a white panel.

A third white panel contains descriptive copy of the product, as well as storage and serving suggestions. The phrase, "Grown In the Pacific Northwest," is repeated twice around the top periphery of the can. And copy on each end, in blue on natural aluminum, identifies the product and warns to keep it frozen.

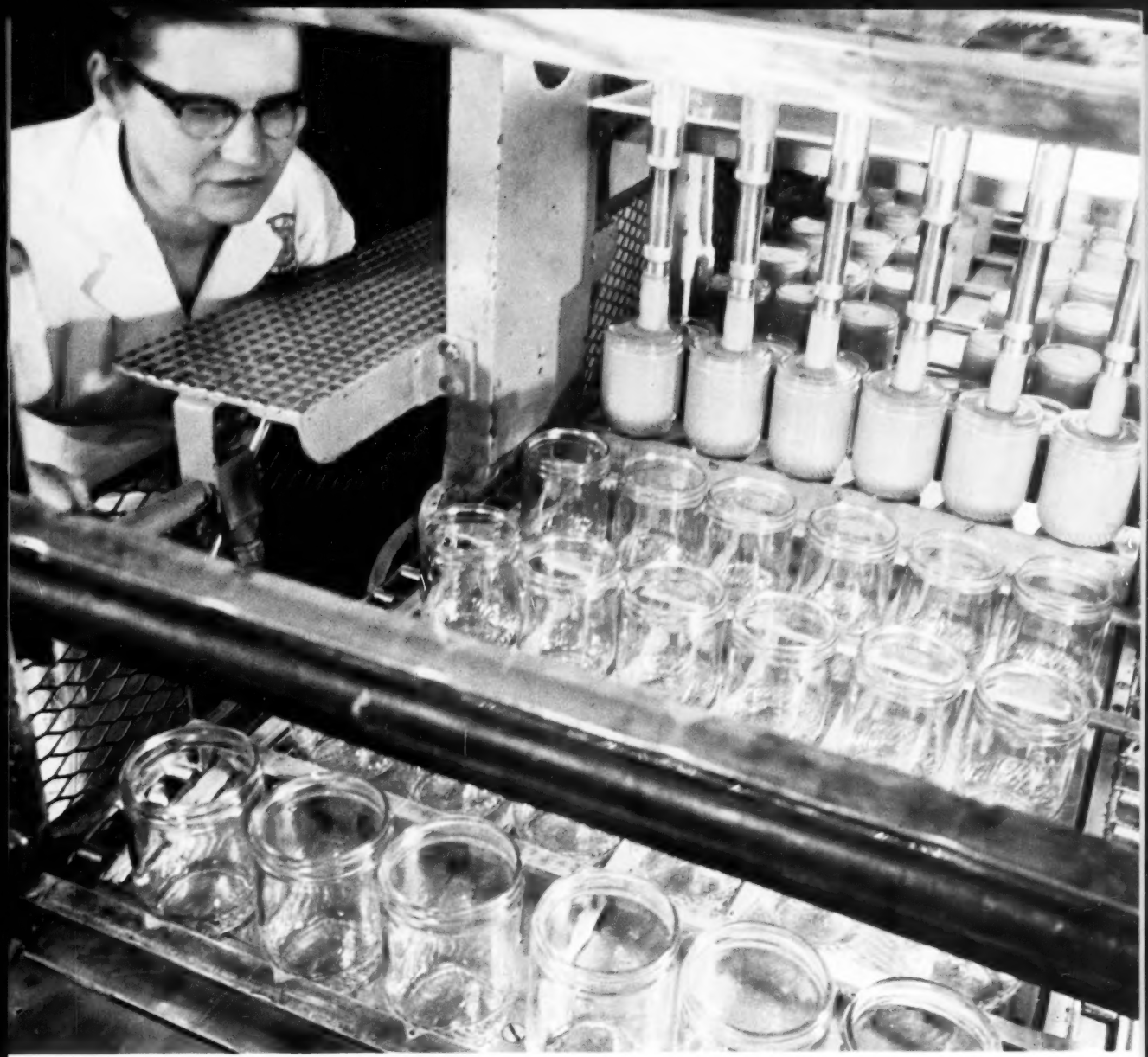
Mum Was the Word

The new package was kept under wraps until Aug. 23, when it was mentioned on Kaiser Aluminum & Chemical Co.'s TV program, "Maverick". By that time, pipelines had been filled so that the company got the full benefit of having a product mention on this high-cost program. gram.

Also, by keeping the container a secret until near the end of the season, Merrill figured on a long competitive head start to help defray marketing and production costs ordinarily associated with a new item.

As of now, he's convinced that strawberries-in-aluminum fit in nicely with the surging demand for high quality foods. And next year, Blue Lake Packers will consider putting up additional fancy-grade berries in aluminum cans.—*FE Staff*

CIRCLE 75 ON READER SERVICE CARD→



"Knox's quality product meets our rigid specifications," says production manager of major food packing firm

The production manager of one of the South's largest packers of peanut butter, jams, jellies, mayonnaise, coffee, and salad dressings,* recently reported on his firm's extremely large use of glass containers:

"Thermal shocks involving rapid temperature changes and production line speeds of more than 100 units a minute, innumerable sharp impacts of glass-on-glass and glass-on-metal, and top clarity to permit immediate product recognition—these are all factors that must be overcome by our glass container suppliers.

"We've been using Knox Glass jars and bottles continuously for almost 15 years. They have consistently met our requirements in dimensions, cleanliness, clarity, and delivery service. They deliver a quality product that meets our most rigid specifications.

"Prompt delivery—often overnight—with a minimum of rejects is also a must for our operation. We plan on operating with a minimum glass container inventory, so the glass suppliers we use have to really give us service. We get this kind of service from Knox."

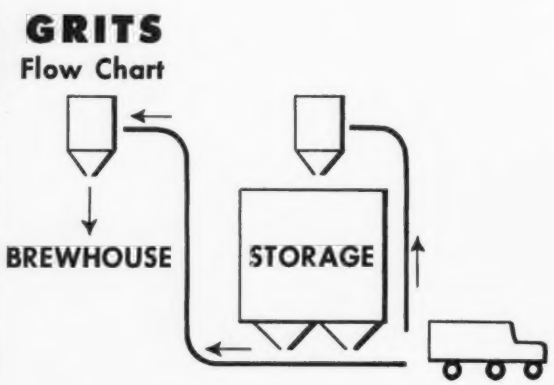
Let your Knox representative show you how Knox can supply you with top-quality glass and top-quality service —consistently. Contact Knox Glass, Inc., Knox, Pa.

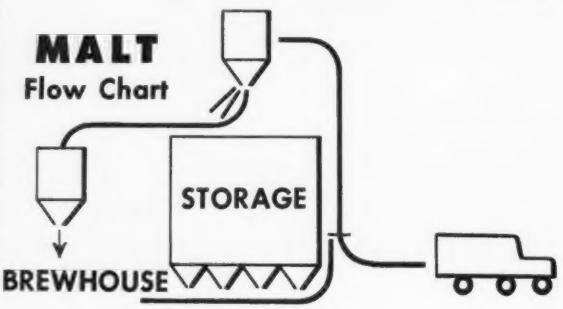
*Name available on request.

the new / **KNOX GLASS**

The Arithmetic of Materials Handling

FULLER AIRVEYOR pneumatic system pulls corn grits from discharge of Airveyor bulk transport trailer to storage silos to weigh hoppers.





PIELS MODERNIZES WITH AIRVEYOR®

saves man-hours, materials, money

When Piel Bros., Brooklyn, N. Y., took over the Staten Island plant of another brewery, they replaced complicated, inefficient mechanical conveyors with a fast, efficient Fuller pneumatic Airveyor® system—to handle tons of malt and corn grits.

Here's what the new Fuller Airveyor system has accomplished:

ELIMINATION OF POSSIBLE CONTAMINATION in the old mechanical system. Totally-enclosed Fuller Airveyors prevent material loss through spillage and eliminate the problem of possible infestation. 100% visible dust retention contributes to sanitary working conditions.

MAJOR LABOR-SAVING through fully automatic control of Airveyors. One man —at pushbutton panel—handles unloading of Airveyor bulk transport trailers, conveying to silos, and directs weighing and proportioning operations.

NEGLIGIBLE MAINTENANCE, because Airveyors have few moving parts and are self cleaning! Downtime for cleaning mechanical equipment previously required eight man hours a week.

If you are now handling dry, granular materials, it will pay you to look into Fuller pneumatic conveying systems. Fuller systems are engineered specifically for your particular application. They bend around corners, run up or down, through walls and floors, almost any distance — even underground. Write or phone today outlining your problem. Fuller will gladly furnish additional information with appropriate recommendations.

THE ULTIMATE in automation — Fuller Airveyor offers simplified, precision control from this remote control "pushbutton" panel.

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4909

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pioneers in harnessing AIR

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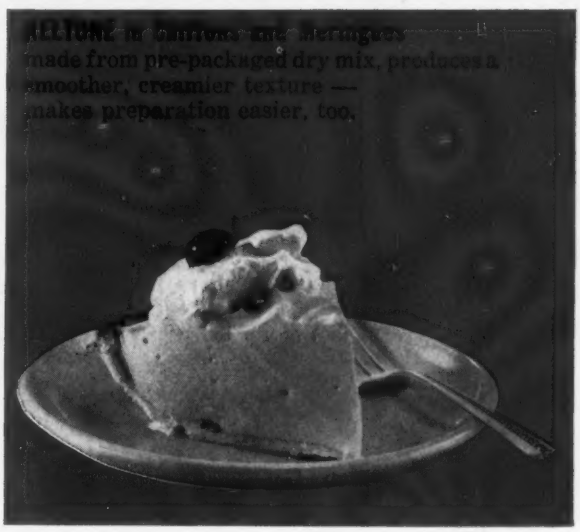
Amazing the way Kelco Algin makes your products better

KELCO-GEL HV in Gels
makes high quality, sparkling clear, tender non-melting dessert and salad gels that have a fast, clean mold release.

KELCOLOID LVF in French Dressings
produces uniform and stable emulsions that look better and taste better. Shelf life is substantially extended.

KELCO-GEL LV in Dessert Puddings
gives smooth texture, firm body for added taste and eye appeal.

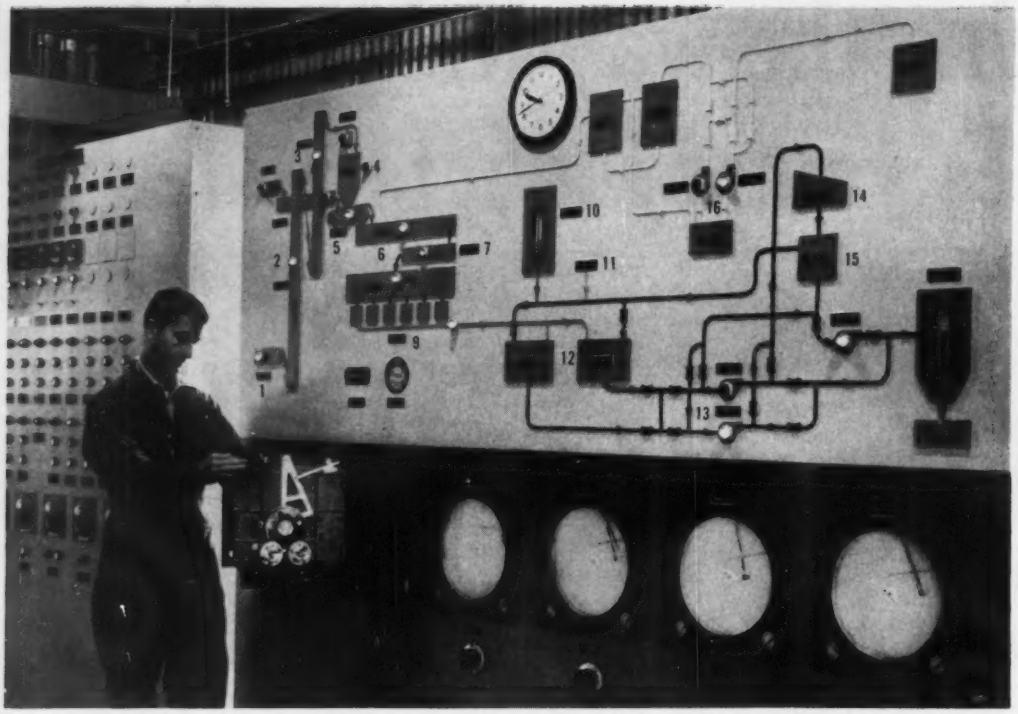


KELTONE in Cakes and Meringues
made from pre-packaged dry mix, produces a smoother, creamier texture — makes preparation easier, too.

—and enables you to develop new, improved products, too!

KELCOLOID LVF® KELCO-GEL HV® KELCO-GEL LV® KELTONE® PRODUCTS OF KELCO COMPANY

120 Broadway, New York 5, N. Y • 20 N. Wacker Drive, Chicago 6, Illinois • 530 West Sixth Street, Los Angeles 14, Calif. • Cable Address: Kelcoalgin



LEGEND

1. Troughing conveyor
2. Bucket elevator
3. Bucket elevator
4. Scales and bins
5. Conveyor
6. Mingler
7. Conveyor
8. Centrifugal mixer
9. Conveyor
10. Sweetwater level
11. Hot water
12. Melters
13. Pumps
14. Liquor screen
15. Surge tank
16. Pumps

THESE PANELS AUTOMATE MELT HOUSE OPERATIONS. Left one has "start" and "stop" buttons, indicator lights, horns to alert operator. Graphic panel (right) maps entire layout, has lights that track progress of individual batches.

1-Point Control Cuts Labor ⅔

A COMPLETELY AUTOMATIC melt house, described as "the most advanced facility of its kind and the first totally automated operation in the field," went into production recently at Imperial Sugar Co's. Sugar Land, Tex., refinery.

Included are highly specialized equipment and improved procedures that are innovations in the refining of raw sugar. They've won the following benefits:

- 1. Continuous operation instead of frequent starts and stops.
- 2. Elimination of human error.
- 3. More accurate records of refinery operations.
- 4. Increased productivity with reduced manpower.

An additional and very important benefit, according to company president, W. H. Louviere, is the significant upgrading of employees. Elimination of hard manual labor has enabled the company to employ a higher type person who can bring ideas as well as mere physical labor to the job, he said.

The new 7-story "house" for storing, washing, and melting raw sugar was designed by Imperial's own engineers, who worked closely with equipment manufacturers. It has 50% greater capacity than the old facility and, with addition of two centrifugals, this can be increased another 50%. Other equipment was designed to take care of this added capacity.

Entire process is controlled from a 2nd floor graphic panel (Minneapolis-Honeywell), with blinking lights that track the progress of every batch of sugar processed in the plant (see photo above).

Buzzers sound for "start" and "stop", and alarm horns signal when an operator's attention is needed anywhere in the plant. These devices are controlled by a second panel (General Electric). The alarms can only be shut off by the operator, insuring that the warning is noted.

Electric eyes watch the sugar as it flows from one machine to another, and gates open and close automatically to regulate the flow. The entire system is interlocking so equipment can speed up, slow down, or cut itself off and come back on progressively, according to operating requirements.

Key controls are housed in a 2nd-floor room near the panels. This area is air-conditioned to protect sensitive equipment from high humidity and temperatures.

In the old facility, nine men were employed per shift. Today, foreman, assistant foreman, and one operator handle the entire operation. First two spend most of their time roaming through the melt house checking the process. Third man watches the

LORRAINE SMITH
McGraw-Hill Southwestern News Bureau, Dallas

RAW SUGAR is conveyed through tunnel from storage warehouse to melt house. Hoppers, 20 ft. apart in warehouse floor, keep belt supplied.

Specialized equipment monitored by graphic panel enables Texas sugar refinery to operate melt house with only 3 men. Old-facility required 9

conveyor when sugar is being blended. The rest of the time he spends cleaning up.

Operations Pinpointed

Melt house receives raw sugar directly from railroad cars or from a 40,000,000-lb. stockpile in company's giant new storage warehouse. A troughing conveyor receives the product as it is unloaded from cars. And in the warehouse, payloaders push it into any of 15 hoppers in a tunnel under center of building.

The hoppers, standing 20 ft. apart, drop raw sugar onto a belt conveyor, that feeds one of two bucket elevators (Continental Gin) in basement of melt house. These elevate product to a scale supply bin on the 5th floor. On its way to the bin, large lumps go through a shredder, but normally this unit is bypassed.

The raw sugar is weighed into 4,000-lb. batches on an automatic scale (Parsons). An electronically controlled gate lets in just enough for each weighing. When level in supply bin is high, an electric eye (Bindicator) causes tunnel conveyor to stop, thus cutting off supply to elevators.

A low-level "eye" prevents dump gate from opening when there isn't enough sugar in bin (at least 4,000 lb.) to complete a scale weighing. A similar eye on the weighed-sugar receiver keeps scale from dumping until sugar from previous batch has gone into process. For flexibility of operation, facilities are designed so that raw sugar may bypass elevators and scale entirely if desired.

Number of 4,000-lb. dumps plus overweight on each are recorded on control panel. This information is also transmitted to a laboratory in another building, where tonnage of raw sugar going to melt houses can be checked by the plant superintendent.

From the scale, sugar moves by conveyer to a mingler (Continental Gin) to be mixed with an affination syrup. This syrup is already saturated with sucrose, so that it dissolves the brownish molasses film clinging to the crystals without melting the sugar.

Sugar and affination syrup form a thick mixture called magma. The syrup, heated to a constant temperature, is added automatically, according to load on mingler motor, which is in direct relationship to consistency (or Brix) of the magma. Previously, addition was controlled by a hand valve.

The magma drops into a centrifugal mixer, where it is heated by hot-water coils, then goes to six centrifugals (Western States) on the 2nd floor. Syrup and wash water from centrifugals flow to supply tanks for recirculation as affination.

Centrifugals in old melt house required manual operation of gate valves and hand wheels to fill and plow off the sugar, but the new units are self-charging and self-emptying. A Flexipulse timer automatically spreads downtime, enabling the machines to operate at maximum efficiency, with an evenly distributed power load. A nearby control panel (Western States) indicates centrifugal operation and alarm horns warn of trouble that may develop here.

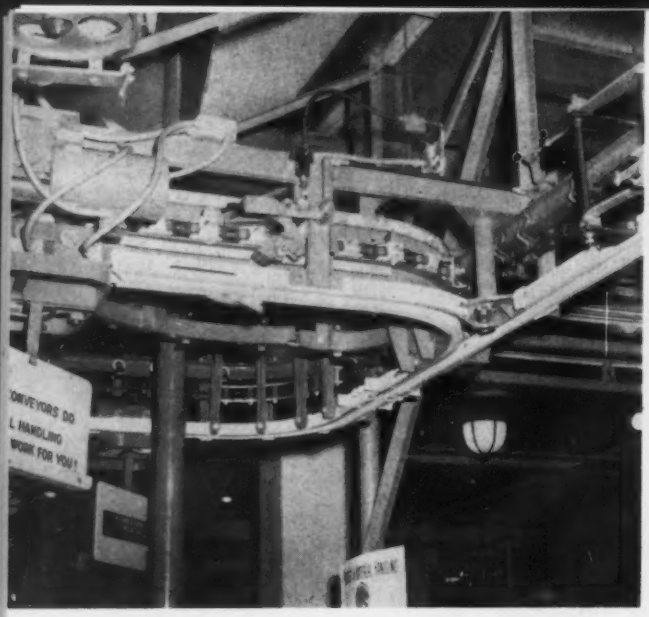
When contents of affination dilution tank reach predetermined level, a pump cuts in automatically and transfers excess to affination tanks in other buildings of the refinery.

Washed sugar is melted in one of two tanks used alternately every 24 hr. so that idle tank can be cleaned. In the melting process, density and temperature of washed sugar liquor, and level of melter's contents, are automatically controlled and recorded on the graphic panel. The Brix control allows sweet water to be used first, before hot water is added.

Pumping speed from melter to a screen surge tank is controlled according to the melter level. After screening, the melt liquor is pumped to other units of the refinery for filtering, decolorizing, and granulating. A low-level "stop" prevents surge tank from draining itself. When tank is at high level, another stop shuts down melter pumps.

The enlarged and modernized plant has a capacity of 2.5 million lb. of raw sugar a day. Approximately 600 million lb. are processed annually. Imperial's refined sugar sales run $40-$50 million annually.

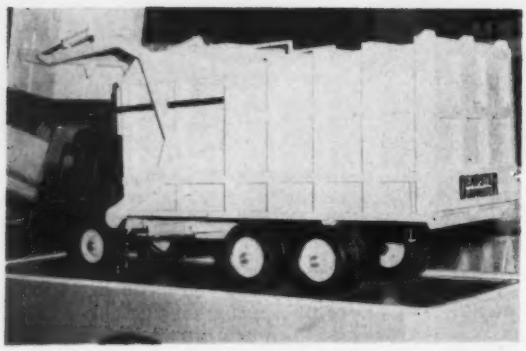
—End



19 Units to

Going after savings in operation dollars? Then check these efficient new moving devices that caught eyes at the recent big MH show in Cleveland

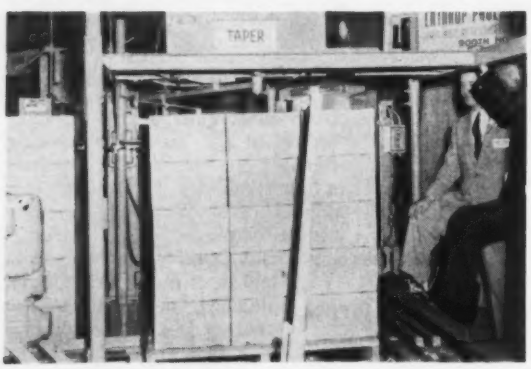
POWER and free conveyor setup is designed so pusher-dog on power trolley engages load-carrying unit on free line. Carriers are raised and lowered by power sections.—Mechanical Handling Systems, Detroit. (342)



COMPACTION TRAILER for disposal work has hydraulic plate to reduce refuse to ¼ volume. Frees bulk containers, making for more efficient storage and pickup. Packer head moves complete length of trailer body.—Dempster Bros., Knoxville, Tenn. (343)

STRADDLE-TRUCK speeds container-freight. It loads 8x8x24-ft. units onto RR flat cars or flat-bed trucks, stacking two high. Also unloads. Employed are hydraulic-mechanical lifting mechanisms.—Clark Equipment Co., Battle Creek, Mich. (344)

2 Specials



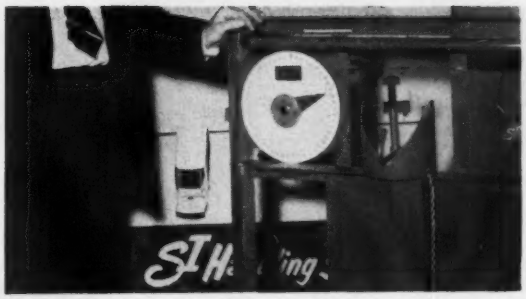
AUTOMATIC LOADER, for pallets, skids, and dollies, operates without electronic or hydraulic components. Eliminates calculations and setup of pattern. Can tape top layer of cartons for maximum safety.—Lathrop Paulson Co., Chicago. (345)

DOOR BUMPER filled with urethane takes shock instead of panel. Has no pivot to wear or hinges to replace—nothing to rip or warp. Spring return insures tight, accurate closure. Neoprene seals eliminate drafts and noises.—Clark Door Co., Newark, N. J. (346)

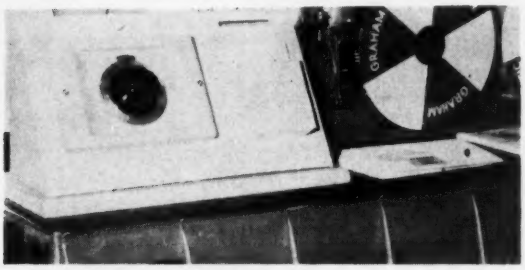
Ease Handlings

4 Automatic Control Systems

RECORDER, driven from speedometer or tachometer, keeps 24-hr. record of handling vehicle's speed, mileage, and time. Has pushbutton speed selector with red warning light.—Service Recorder Co., (Cleveland. (347)



ROBOT-CART is dial-set when loaded and put on tow line, then automatically dispatched to destination, where it's switched off. Second setting returns empty cart to loading point.—S. I. Handling Systems, Easton, Pa. (348)



LOW-COST automatic and remote control uses either rotary- or linear-type actuator. Unit positions valves, sets feeders, adjusts vari-speed drives and displacement pumps, spots conveyors.—The Jordan Co., Milwaukee. (349)

PHOTOELECTRIC READER identifies binary-coded, conveyorized packages traveling at 200 fpm. Accompanying selectors for each transfer station energize memory system.—General Electric, Waynesboro, Va. (350)

11 More Top-Flight Units

WEIGHING ATTACHMENT for lift-truck features steering-column instrument that converts load-cell's electrical signals to weight reading.—Clark Equipment Co., Battle Creek, Mich. (351)

3-TON electric truck has resistor control that reduces heat by drawing current at rate proportional to speed.—Yale & Towne Mfg. Co., Philadelphia. (352)

4-DIRECTIONAL truck moves forward, backward, or sideways from standing start. Latter movement enables handling of long loads in 7-ft. aisles.—Raymond Corp., Greene, N. Y. (353)

MAGNETIC MEMORY SYSTEM employs pushbutton dispatch station that sets up addressing unit. . . . Thus, code is imparted to carrying conveyor or product. And at discharge station, a unit "reads" code and activates appropriate mechanism that sends material to pre-selected area.—Standard Conveyor Co., N. St. Paul. (354)

SYSTEM COMBINING power and free conveyor features 80 route-selections. Transistorized control stations signal electric switches serving branch lines.—Columbus McKinnon Chain Corp., Tonawanda, N. Y. (355)

CRAB TRUCK has "360 deg. steering"—maneuvers in any direction, at any angle, with any type load.—Automatic Transportation Co., Chicago. (356)

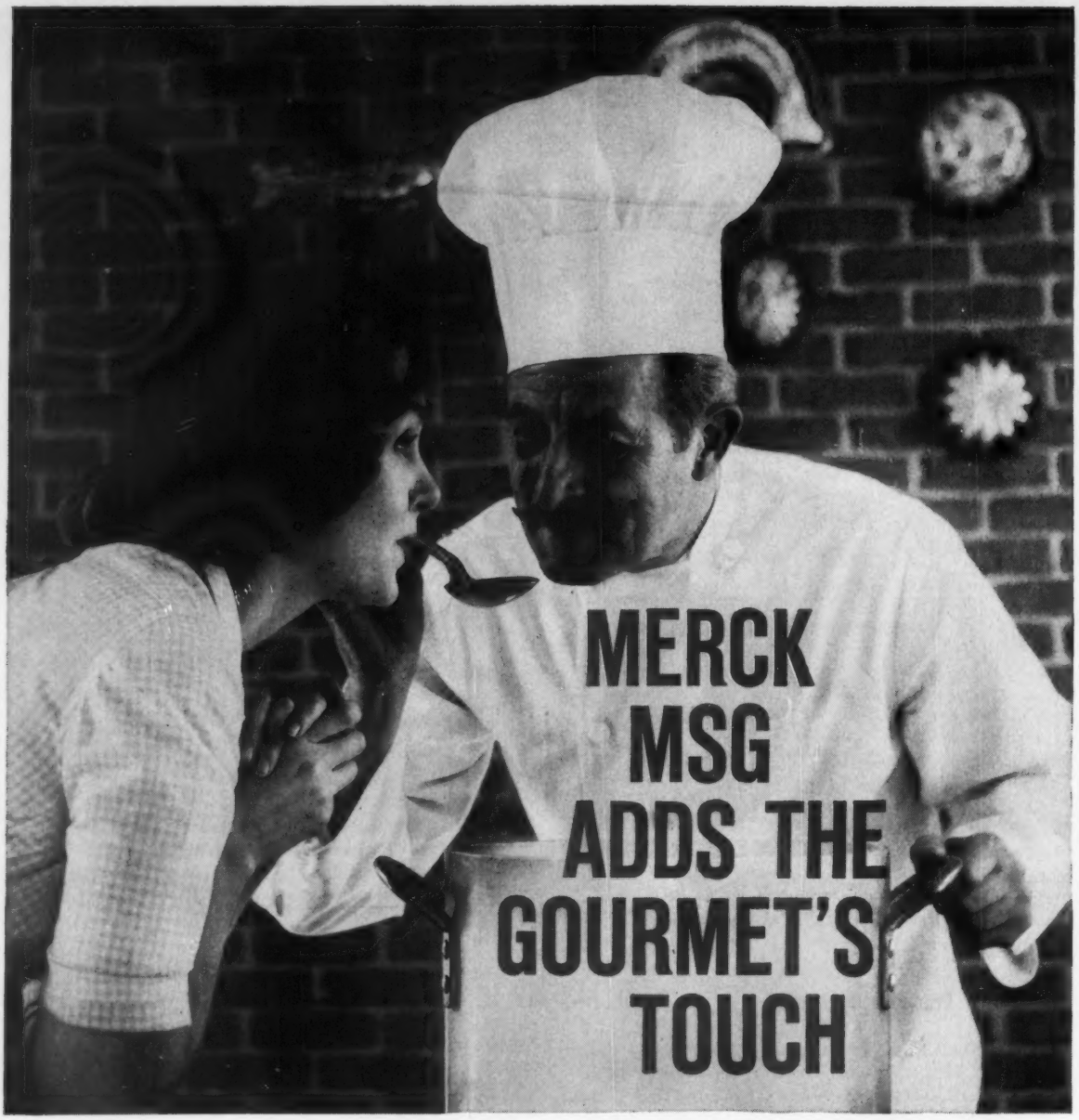
STATIONARY HOPPER tilts Tote Bins 45 deg., has stainless screw flight mounted on Howe scale. Comes complete with air cylinder, pipe stand, and motor drive.—Tote Systems, Inc., Beatrice, Neb. (357)

FLOOR CONVEYOR for trucks or trailers employs central roller chain powered by reversible electric power unit.— H. S. Watson Co., Toledo. (358)

BULK CONTAINER of aluminum (850 cu. ft.) has pockets to permit hoisting by lift-truck to RR cars or flat trucks.—Reynolds Metals Co., Richmond, Va. (359)

PNEUMATIC STACKER is limit-switch operated to index and tier conveyor-fed pans. Built-up stack is loaded on truck or carrier.—Union Steel Prod. Co., Albion, Mich. (360)

Circle key numbers on Reader Service Card, back of book.



You don't have to consult a French chef for the secret of making a good food product taste better. Simply start using Merck MSG. Merck is your new basic source for this flavor-enhancing ingredient. Merck's technically advanced manufacturing process assures dependable delivery in the quantities you require. Rigid quality-control procedures provide lot-to-lot uniformity of monosodium glutamate 99+% pure. And Merck's Food Research and Technical Service Staff stands ready to help you at all times. Get complete information on how Merck MSG can add the gourmet's touch to your products by contacting your nearest Merck Sales Office or writing directly to Rahway.

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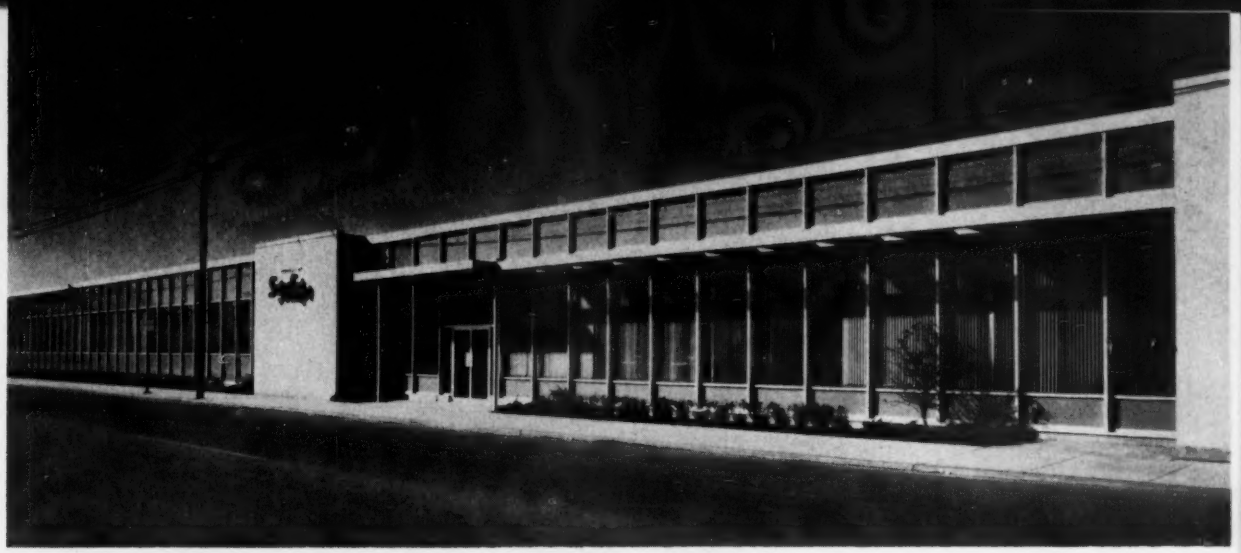


Functional design, attractive sweep mark Sara Lee's—

Dream Plant Come True

Handsome new facility sets striking example of modern machine layout for operators patterning smoother handling, more efficient processing for the '60s

LIKE MANY another food operator, The Kitchens of Sara Lee, Inc., Chicago, had a dream: To move from several multi-story ancient buildings to a brand-new bakery, tailored to both its present and future needs.

Now that dream has come true—with the aid of a progressive management and a closely knit team of plant operating people and architect-engineers.

Until this last summer, Sara Lee operated from two buildings. One in Chicago occupied 35,000 sq. ft., another in River Grove, Ill., 40,000. Many doorways, walls, stairways, and elevators caused continual problems in materials handling and personnel traffic. Quality-control and engineering departments were located a long way from processing. Products were frozen in commercial facilities instead of on bakery premises. Offices were in cramped rooms. Raw material handling and storage? Company officials don't even like to remember what it was like.

Now all this is changed. Ingenious layout provides minimum handling distance in the new one-story $4-million facility in Chicago. Raw material handling is tremendously simplified, completely mechanized in most cases. Wide expanses provide easy flow of materials and people. Maintenance, quality control, and industrial engineering are located near operations for quickest action on whatever problems arise.

JOHN V. ZIEMBA
Associate Editor, "Food Engineering"

Processing occupies 40,000 sq. ft., divided into two sections—one for mixing and makeup, the other for proofing, baking, finishing, and packaging. Sanitation features are stressed in the production area, which is sealed from outside heat, light (there are no windows), and dust. Air that's filtered, temperature- and humidity-controlled is circulated throughout the area. Pastel tile walls, round-cornered tile floors, vacuum-cleaning facilities, and automatically-controlled CIP system assure high-level sanitation. Fluorescent lighting reproduces daylight.

Water, gas, steam, air, cooling, syrup, egg, and milk lines are overhead, running just below the beams. Color-coded, these lines are easily accessible, provide an uncluttered, neat appearance.

Raw materials flow into one end of bakery, packaged baked goods emerge by truckloads from other. Frozen packaged goods are freezer-warehoused to give 1- to 2-week inventory. Once stock starts moving, however, it normally doesn't stop until it hits shipping dock.

Large volumes of raw materials, products in process, and finished goods move with minimum of effort. One example is bulk handling of 35F. fresh eggs. They are pumped (Waukesha) from insulated, 20,000-lb. tank trucks to refrigerated, agitator-equipped dairy tanks (Cherry-Burrell). Yolks go to two 6,000-lb. tanks, whole eggs to two 12,500-lb. units. As needed, they are metered (Siemens) into mixers.

Fresh whole milk arrives by tanker and is pumped to two 12,500-lb. tanks. There's a CIP system for pipelines and tanks handling eggs and milk. Sanitary pumps (1½ hp.) are of 2-speed type—15 gpm. for delivery to process, 30 gpm for CIP. Operations of milk- and egg-handling system—pumping, agitating, refrigerating, etc.—are controlled by panelboard (GE). Adjacent to panel are remote-reading liquid-level gages (King).

Corn syrup is "tanked" to bakery, stored in a room-enclosed 50,000-lb. tank with area thermostatically maintained at 110F. by space heaters. Syrup is then metered to mixers.

Flour (750-800 lb./min.) and sugar (400-450 lb./min.) are emptied from Airslide RR cars by a portable, 2-valve pneumatic unloader hooked to a 15-hp. blower. Through a single

pipeline (with separate return), products are air-conveyed (Baker-Perkins) to a switch-over station for delivery to nine bulk bins (up to 70,000-lb.).

Materials are pneumatically delivered (flour's also recirculated) by 2-stage 40-hp. blower, through 6-deck, gyratory sifter (Allis-Chalmers), to three scale hoppers (800 lb.) over mixers (two 1,000-lb. Artofex, four 340-qt. Glenn). Operator sets weight of each ingredient on scale dial, then selector-switch on demand panel adjusts flow to sequence desired.

Bulk bins have filter bags (11 on top of each), Syntron vibrators, automatic high-low level detectors, and air jets (to fluff flour). As an overload safeguard (at Airslide and bulk tank discharge sides), an automatic pressure-control system stops the rotary feeders at a pre-set maximum, starts them again when it's safe. Control system is also hooked to start and stop vibrators and air jets.

Sugar is piped directly to mixers or bypassed to in-line pulverizing system. In latter case, it goes to 3,500-lb. holding tank, from which it's gravity-fed to Micropulverizer and 2,000-lb. hopper at a 50-lb.-per-min. Sugar is cooled by 35F. filtered air during grinding, with a proportional addition of starch to avoid caking. It's then conveyed to scale hoppers (140 lb. per min.).

Palletized miscellaneous perishables are handled in and out of 36F. and 50F. coolers by fork trucks. Same system is used for dry ingredients (cocoa, chocolate, baking soda, etc.).

A 1,000-sq. ft. area is being constructed for fresh-fruit operations (inspecting, cleaning, grinding). The fruits likewise are pallet-truck handled.

Sara Lee found a labor-saving way of bulk handling its huge volume of rigid foil containers. They're received in disposable pallet-type shipping containers.

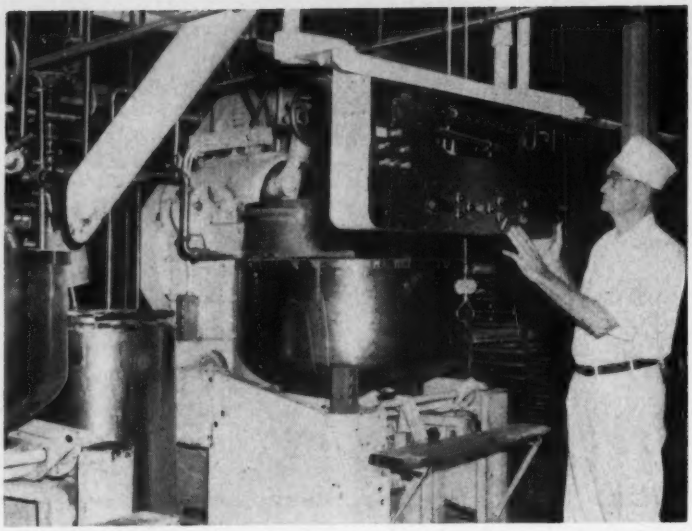
Topnotch Processes

Latest equipment has been installed, with the prime objective of consistently producing uniform quality products.

Here's a run-down on key units:

▶ **Three continuous cake-batter mixers** (Oakes), with built-in CIP system. Bowls of pre-mix from Glenns are dumped by electric hoist into 100-gal. surge tanks feeding mixers.

▶ **Sanitary, hopperless multi-nozzle depositor** (Oakes), piped directly to continuous mixers. Stainless unit is air-operated and time-cycled for uniform depositing of batters in foil pans that double as bake containers and packages. Unit also has pneumatic-operated pan greaser.



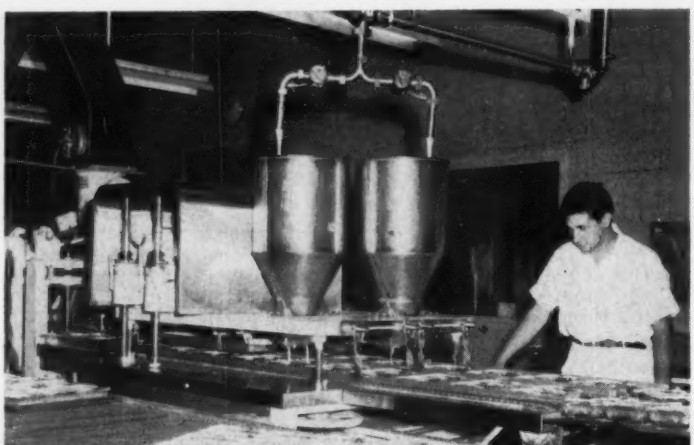
DEMAND PANEL enables mixer operator to feed ingredients by mere push of buttons. System provides utmost precision.

▶ **Specially designed continuous dough makeup unit.** It takes over after plasticized egg-butter mix is hand-rolled into coffee cake dough which, through a time card-punch system, is cycled through retarder and roll sheeters.

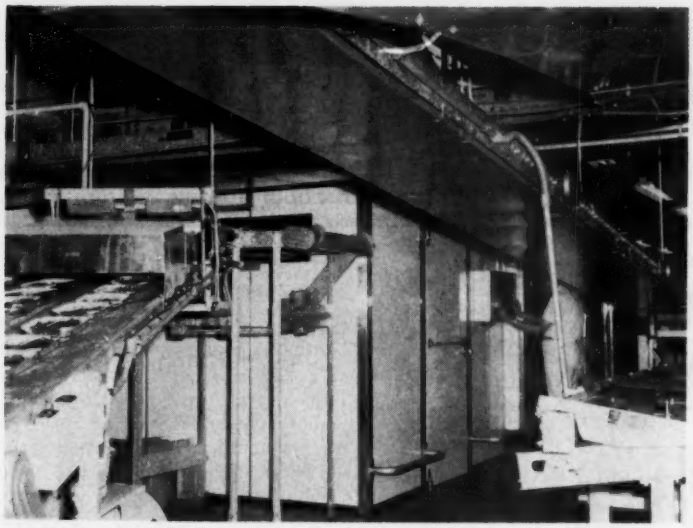
Unit employs pushbutton-operated electric hoist that, pan-by-pan, indexes rack for simplified feeding to two sets of paired rolls (14-in. dia.), staggered over one another. The rolls form doughs in two uniform sheets. Filling, pumped from supply tank (1,000 lb.) to feed hopper (100 lb.), is deposited (through a pair of 5 in. rolls) on bottom dough sheet.

The two sheets are pressed together (with filling between) by a cross roller, then proceed to a guillotine-type cutter that forms them into strips for hand-braiding and depositing in pans.

▶ **Two multiple-drive systems** (Varidyne, U.S. Electric Motors) sharpen



CHEESE-CAKE MACHINE adds measured quantity of cracker crumbs to pan, tamps it evenly, then deposits cheese filling.



BLOWER-TYPE CHILL ROOM has multi-tier conveying system to set frosting on cakes, prevent sticking to lids of containers.

control over product flow during continuous final makeup and proofing operations. Compact power units (consisting of motor and alternator) convert 3-phase induction motors to variable-speed drives, synchronize their operations, and equalize load distribution.

Makeup system's power unit (7½ hp.) synchronizes speeds of four 1½-hp., two 1-hp. and nine fractional hp. motors. A 2-hp. power unit operates two ¾-hp. motors carrying panned goods in eight passes through proofer (intermediate and final).

▶ **Company-designed cheese cake unit** assures precision in amounts of ingredients used—cracker crumbs for bottom-crust and cream cheese for filling. Cracker crumbs are conveyed (by bucket elevator and screw) from floor-level bin to hopper feeding 4-pocket filler. Chain-driven rotary filler is indexed through cam-limit switch system. Four-headed tamper, with rotary scraper, evenly spreads crumbs in containers. A 2-head filler introduces the cream cheese.

▶ **Pneumatically-operated icing machines (for coffee and chocolate cakes), egg-wash sprayer, pecan nut-depositor, and sour-cream topper (for cheese cake).** Conveyors feeding trays of filled containers are indexed to these machines through electrical-mechanical systems employing cams, limit switches, and photoelectric relays. Air-operated pump (Alemite) moves icings and sour cream from mixer bowls to fillers.

▶ **Temperature-controlled, 30-ft. long blower-type set room,** where iced chocolate cakes make eight passes.

▶ **Conveyor systems for highest efficiency in handling panned goods.** These operate in conjunction with 120-ft. proofer (in-end and out-end), three ovens (two 100-ft., 4-zone, one 55-ft., 3-zone), and the 8-pass coolers (50-ft.).

Briefly, these are some of the features providing uninterrupted flow—

Fork-type chain elevator with permanent magnets to hold pans being raised from coffee cake-braiding and foil pan-packing line to proofer located above oven.

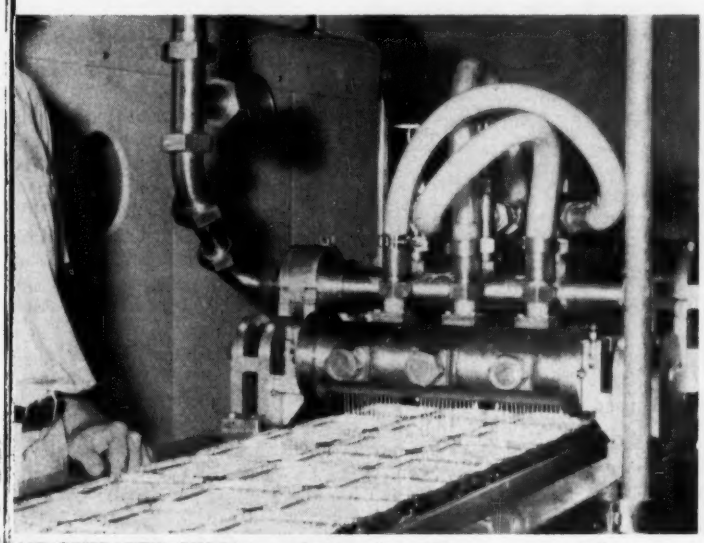
System that brings pans into single row for automatic loading into proofer, ovens, and coolers. This grouping is accomplished by mechanical stop and photo-electric arrangement, loading by a pusher-bar mounted on a pair of chains.

Synchronized unloading of pans from proofer, ovens, and coolers—with chain conveyor timed to oven discharge and walking-beam conveyor. When chain is filled with pans, the load serves to break beam of photoelectric eye, causing discharge to transverse conveyor.

Pans holding containers of cheese cake are mechanically indexed into a single-row on pneumatically-operated chain-drive conveyor, then are elevated to bypass cooler and transfer to 200-ft. loop conveyor feeding sour cream depositor. This way, cakes are sufficiently cooked to receive cream. Cakes then proceed to cooler.

▶ **Germicidal ultra-violet lamps,** under which foil-container packed cakes pass on their way to packaging stations, where lids are automatically applied and crimp-sealed (Ekco-Alcoa).

▶ **Automatic empty panner stacker** (Velter & Pulver). Pans pass over short inclined roller conveyor, strike finger that energizes limit switch actuating hydraulic ram that indexes chain-driven fork. Fork is lowered each time pan strikes finger, and pan is deposited on a dolley. On completion of a full stack, another ram sweeps load away, and unit recycles to receive more pans. —*End*



AIR-OPERATED UNIT tops cheese cake with sour cream. Other pneumatic machines apply icing, spray egg-wash, deposit nuts.

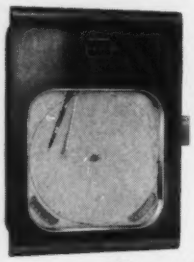
BRISTOL'S INSTRUMENTATION

★ *News and information about automatic controlling,*

Advanced developments from Bristol

SET NEW STANDARDS IN PNEUMATIC CONTROL INSTRUMENTATION

• assure dependable accurate control • easy servicing • convenience in use



New ideas at Bristol are revolutionizing some of the older concepts of pneumatic control instrumentation. These giant strides are making obsolete many designs that are only a few years old—but are already outmoded by modern Bristol equipment that gives better control of process variables and sets new standards for dependability.

Take, for example, the new Bristol Series 500 Wide-Band Pneumatic Controllers. These recent products of Bristol engineering and development are outstanding for stability of output on difficult process-control problems. They incorporate many advanced features, such as reset action stops and a true zero derivative setting, which are found on no other line of pneumatic controllers.

Best maintenance record

Basic simplicity, accurate design, closely held manufacturing tolerances make one single adjustment all that's necessary on the Bristol 500—even after complete disassembly and reassembly with replacement parts.

This practically "built-in" calibration is typical of the foresight and engineering planning that make the Series 500 the easiest pneumatic control system on the market to service. Cut-and-try methods are eliminated. No special maintenance skills are required. All parts are completely interchangeable. The result: a truly superlative maintenance record in thousands of industrial plants.

Famous Bristol measuring elements

The heart of an instrument, whether it be for recording, controlling, or telemetering, is its sensing and measuring system. That's why, for the 70 years of its existence, the Bristol Company has thrown its resources into the development of measuring systems.

Today, Bristol has longer, wider experience in this field than any other instrument company. Bristol leadership in measuring elements is recognized and respected the world over.

Bristol instruments come with the widest selection of high-quality measuring elements available for any line of instruments. **Temperature, pressure, vacuum, draft, absolute pressure, liquid level, flow, humidity, density, pH, are just a few of the variables that can be measured—plus a large number of other variables measurable with air-controlling electronic potentiometers and bridges.**

SEVERAL HUNDRED STANDARD MODELS MEET EVERY PROCESS REQUIREMENT INCLUDING:

These problems:	These operating modes:
1. Cascaded control	1. Fixed narrow band (on-off)
2. Selective control	2. Proportional—to 100% and to 30%
3. Ratio control	3. Reset with wide band—to 400%
4. Time program control	4. Derivative (rate)
5. Pneumatic transmission	5. Reset plus derivative

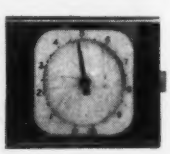
Bristol pneumatic control assures uniform ceramic tiles

Uniform size, color, texture and strength of ceramic tiles depend, among other things, on exact control of firing temperature. That's why Orange County Ceramic Tile Manufacturing Company, Huntington Beach, Cal., makers of the brilliant SUNSET tile line for home and industry, use Bristol Dynamaster* Electronic Pyrometers for accurate automatic control of kiln temperature. Precision automatic control insures an exceptionally uniform product and frees skilled production line supervisors from the need of constant checking.

**T.M. Reg. U.S. Pat. Off.*

Electrical measurement with air control, electrical control, digital or analogue read out

Bristol Dynamaster* potentiometer and bridge instruments are the most widely versatile electronic instruments on the market today. Models are available not only for precision pyrometry with thermocouples, radiation pyrometers or resistance thermometers, but for measurement, recording and electrical or air control of pH, speed, voltage, current, power, resistance, strain-gauge output and many other variables. An extremely wide variety of attachments and accessories is available—including auxiliary transmitting devices, digital encoders, alarm contacts, etc. Round or Strip charts (see photos below). Most models available for standard 19" relay rack-mounting.



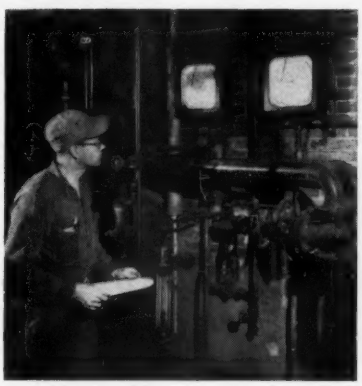
NEWS AND NOTES

recording and telemetering instruments from Bristol

INSTRUMENTS HELP EXTRACT STRATEGIC MANGANESE

These Bristol Series 500 recorders and recorder-controllers are keeping tabs on the exclusive manganese extraction process used by Manganese Chemical Company, Riverton, Minnesota, one of the few domestic producers of chemical manganese compounds. The Bristol air-control instruments monitor reducing gases, cooling gases, indicate leach liquor liquid levels and record vital temperatures in the production process. The plant is in operation 24 hours a day, 7 days a week and the Bristol 500's stand up to this grueling service with the same outstandingly high reliability that they are showing in hundreds of other chemical plants throughout the world.

500's CONTROL OIL TEMPERATURE FOR STEEL ROLLING



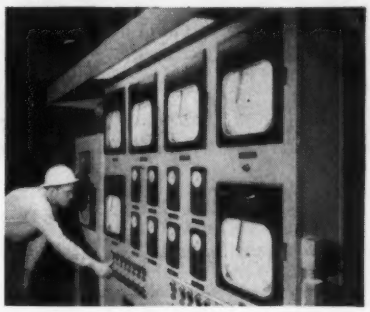
These Bristol Series 500 instruments are two of a number used to control the temperature of lubricating oil supplied to the rolling mill main bearings on the number one rod mill at the Cuyahoga Works of U. S. Steel's American Steel & Wire Division.

The instruments maintain temperature of the lubricants at 100°F for the entire system by controlling the amount of cooling water being used.

Bristol Series 500 instruments are noted for their excellent maintenance record under severe environmental conditions, can be maintained without special skills, special tools. What's more, Bristol service engineers, operating out of the main plant, four branch plants, and from 44 principal cities, are available to help you apply series 500's (or any Bristol instruments) and assure you of their long, continuous, trouble-free service.

3 big reasons for air-control in this plant

Sometimes it's a toss up between air or electronic control. Not so in Lithium Corporation of America's Bessemer City, North Carolina, plant for extraction of lithium from low-grade ore. Three cogent reasons suggested air control for a large part of this operation: (1) positive pressure of 15 to 20 psi would protect the system from humidity, dust and corrosive fumes, (2) short transmission lines (none longer than 1100 ft., most only 200 to 300 ft.) would insure positive, lag-free operation and (3) cost of an air-control system for their $7-million plant was estimated at only $150,000 to $200,000.



Have any doubts about what control system you should use? Get Bristol's absolutely unbiased recommendation: As makers of *all types* of electronic and pneumatic process control instruments, Bristol is in a unique position to help you get the instrumentation that's exactly right for your needs.

0.49

ASK FOR COMPLETE DATA

We'll be glad to send you complete technical information on any Bristol instrument. Or trained Bristol field engineers, familiar with the problems of your industry, will welcome the opportunity to discuss a complete, integrated system of measurement, recording or control—pneumatic or electronic—for your plant. Write The Bristol Company, 115 Bristol Road, Waterbury 20, Conn.

BRISTOL TRAIL-BLAZERS IN PROCESS AUTOMATION

AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS

USCOLITE PLASTIC PIPE

CONFUSED ABOUT PLASTIC PIPE?

(MOST EVERYONE IS)

Here's your guide:

U. S. Uscolite® CP acrylonitrile-butadiene-styrene copolymer (ABS-I) pipe is best where maximum resistance to impact is demanded. It will safely handle most chemicals of industrial importance at working temperatures up to 170°F. This is the major plastic pipe used by chemical processing industries.

U. S. Uscolite RV polyvinyl chloride (PVC-I) pipe is best for extremely active oxidizing agents such as strong sulphuric, nitric and chromic acids. This unplasticized, unmodified Type I PVC has high impact strength and handles temperatures up to 140°F, far in excess of normal requirements.

Uscolite HT (ABS-II) pipe is a new addition to the resin-rubber compounds. HT stands for exceptionally High Tensile qualities, plus much better retention of physical properties at High Temperatures.

These types of Uscolite Pipe cover all requirements, not only because they are virtually immune to internal and external corrosion, but they are non-contaminating, odorless, impart no taste or discoloration. Because of these qualities they are approved by the National Sanitation Foundation for carrying drinking water. The use of Uscolite results in a saving of appreciable dollars in installation costs and reduction in man-hours. The skills to install metal pipe are not required to install Uscolite. Assembly can be accomplished in half the time. *Not one foot of Uscolite Pipe has ever failed in service when used in accordance with our recommendations.*

A fourth pipe, *UscoFlow HT (ABS-II)* is a black utility pipe, especially suitable where low first costs are a factor. It's a blend of styrene-base resin and synthetic rubber for good impact resistance and high tensile strength. UscoFlow is the ideal answer to builders and large developers who are seeking long-lived, maintenance-free pipe for plumbing.

We invite detailed inquiries or call your "U. S." plastics distributor. He has the *largest* line of plastic pipe and fittings, plus an experienced background to settle any and all questions about which pipe to use.

Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Company, Ltd.

New Flexible Coupling Solves Mixer Problem

Blending batches of Jewish rye bread dough (about four times as stiff as ordinary doughs) places considerable stress on a mixer's drive and motor. At Castle Baking Co., Chicago, it resulted in breaking the coupling between the 2-speed (12 and 25 hp.) motor and floor-mounted speed reducer driving the mixer.

To obviate a recurrence of this, company installed a "dry fluid" coupling (Flexidyne, Dodge Mfg. Co.). This drive (photo) not only solved the breakage problem, but markedly increased production enabling the mixing of 800-lb. batches instead of the former 500-lb. ones.

Unit's "fluid" is heat-treated steel shot, contained in measured amount — the flow charge — in a housing that's keyed to motor shaft. As motor starts, centrifugal force throws flow charge to housing perimeter, packing it against housing and rotor, transmitting power to load. After initial period of slippage, housing and rotor lock to achieve full load speed.—*FE Staff*

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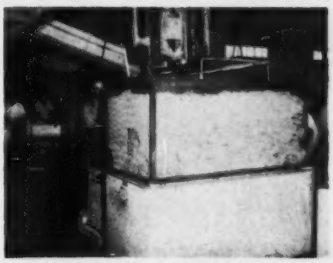
Send your idea today, before you forget. Address it to Practical Ideas Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y.–The Editors.

Hinged-Bottom Basket Speeds Handling



To facilitate handling of poultry in chill tanks an insert basket-liner has proved most effective. Basket (top photo) is designed to fit inside existing chill tanks. Its essential parts are: Angle iron frame ½ in. expanded metal sides, two hinged trap-doors with trip mechanism for bottom. Trap doors are designed to lock automatically, when basket is set inside chill tank. Lock is tripped by lever for dumping contents (lower photo). For mechanical handling, basket has handles through which the blades of a fork-truck may be passed. (Designers caution: Make sure that all ice and chill water are released from carcass for complete drainage).—*USDA & U. of Ga.*

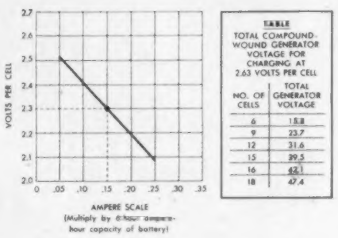


TABLE
TOTAL COMPOUND-WOUND GENERATOR VOLTAGE FOR CHARGING AT 2.63 VOLTS PER CELL

NO. OF CELLS	TOTAL GENERATOR VOLTAGE
6	15.8
9	23.7
12	31.6
15	39.5
16	42.1
18	47.4

Chart Assures Accuracy When Charging Batteries

This handy chart provides a simple method of determining proper charge rate for any lead-acid battery being charged on an 8-in. basis by motor-generator equipment, either shunt- or compound-wound.

It applies to batteries of any number or size cells, in any state of charge.

Here is how to use it:

1. Place battery on charge for approximately 1-hr., or until machine is warm.
2. Use voltmeter to determine voltage at battery terminals.
3. Divide terminal voltage by number of cells.
4. Mark volts per cell on diagonal line of chart.
5. Read down to corresponding point on ampere scale.
6. Multiply this value by 6-hr. (amp.-hr. capacity of battery, found on battery nameplate). Result is proper rate of charge.

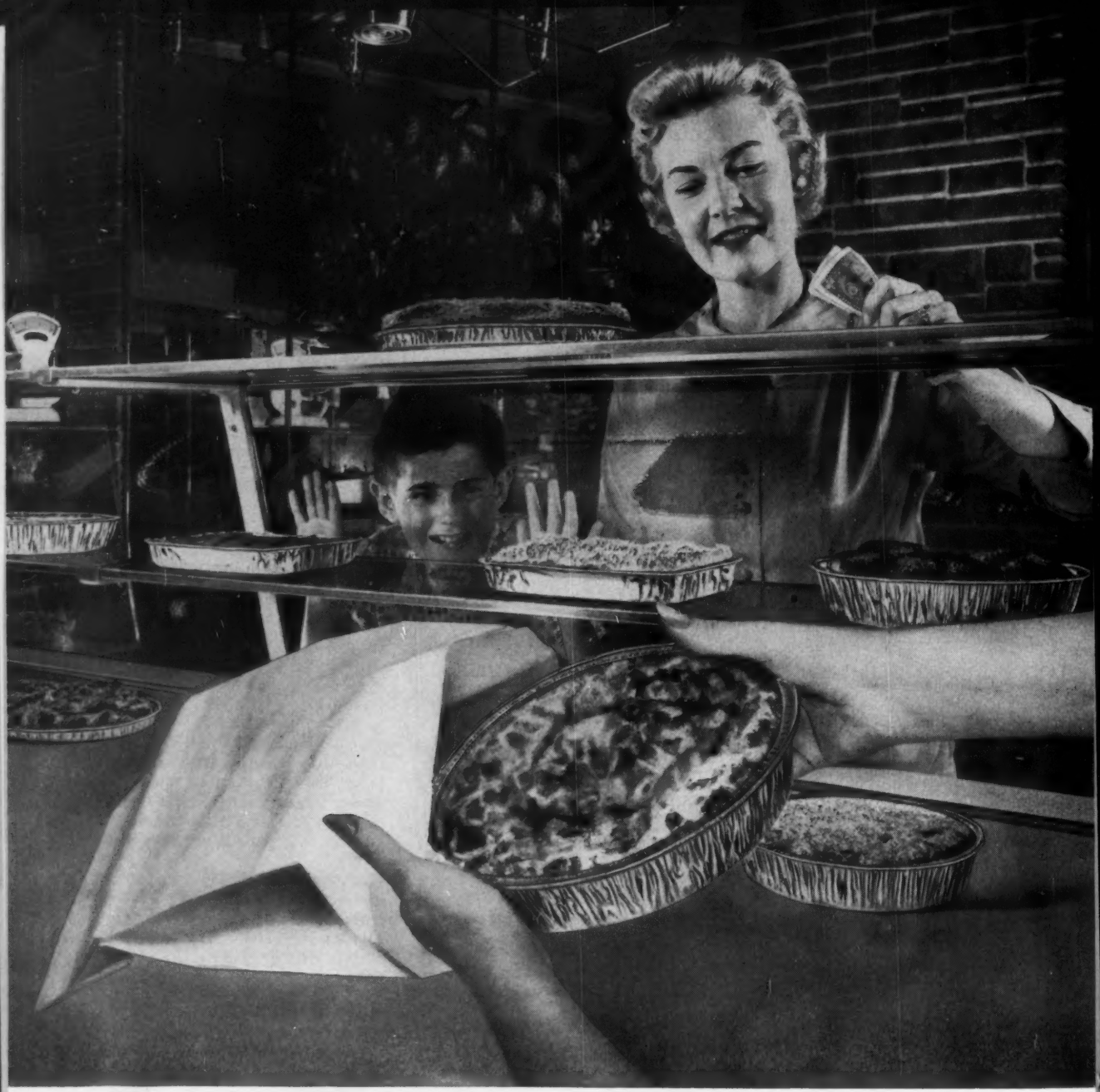
7a. With shunt-wound equipment, adjust generator field rheostat to produce proper rate of current.

7b. With compound-wound generators adjust heavy series resistor between bus and battery to value that produces proper current. Make sure generator is set at total voltage indicated in table for number of cells in battery.

8. Approximately 30 min. after making adjustment repeat check by repeating steps 2 through 6 and readjust if necessary.—*Exide Ind. Div., Electric Storage Battery Co., Philadelphia.*

Self-Dump Hoppers Cut Labor

By replacing 40 manually-handled trash-cans with 10 self-dumping hoppers, Utz Potato Chip Co., Hanover, Pa. slashed 20 man hr. per week from its waste disposal prob-



Foil saves, foil sells . . . *SO MANY ITEMS!*

Yes, foil containers make money for you—the easier way!

They save . . . with no product transfers . . . no cripples . . . no pans to burn-in, grease, wash or dry. In short—foil containers save you time, labor and money.

And foil containers sell. They catch the customer's eye, reflect the quality of your baked goods, offer the customer store-to-table service and reheat convenience, too.

You can find a large variety of stock containers to fit your existing equipment—if you come to Ekco-Alcoa. We have, by far, the largest line of foil containers in the industry. Why not take advantage of the saving and selling advantages of foil? Write for free Ekco-Alcoa catalog today!

The Plus Container

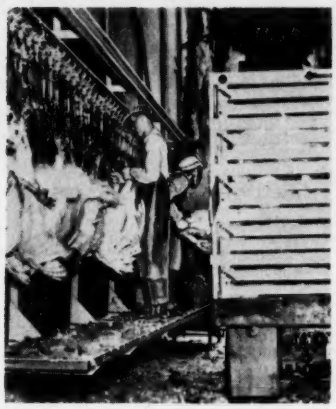
EKCO-ALCOA CONTAINERS INC.

WHEELING, ILLINOIS · WHITTIER, CALIFORNIA · LONG ISLAND CITY, NEW YORK

EKCO is the registered trademark of Ekco Products Company, ALCOA is the registered trademark of Aluminum Company of America. The corporate name and combination mark, EKCO-ALCOA, is used under license to the manufacturer by each of these companies.

lem—carting away 20 tons of refuse.

Six of these hoppers (Roura Iron Works, Detroit) are handled by one man operating a 2,000-lb. lift-truck (photo). The other four are on casters. They are pushed to a stainless chute which discharges to the dump-truck station. To dump a hopper involves only the release of a lock-handle. Then hopper tilts forward automatically, dumps, returns to upright position and locks. —*FE Staff.*



Platforms Speed Unloading

This dual system of work platforms fixed to overhead cable conveyors may be raised or lowered like an elevator to facilitate unloading of live birds at Faribo Turkeys, Inc., Faribault, Minn.

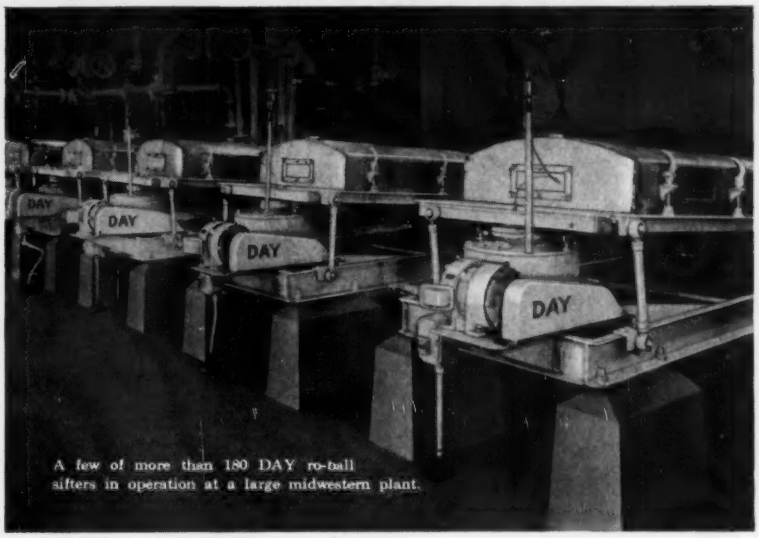
Input, too, is faster, more uniform since operators automatically adjust height of work platform to the tier from which they are unloading turkeys.

The platform ("Ride-A-Track") is rigidly attached to a horizontal section of cable conveyor. At input end, conveyor has two flexible monorail sections ("Limber-Dip") which connect to fixed in-plant cable conveyor. As platform is raised or lowered flexible section bends to accommodate height change. Its reciprocating movement, limited to vertical plane, is achieved by a 2-dimensional ball and socket arrangement. Sections are held together by spring-loaded cable that retains proper arc at all platform elevations.—*FE Staff*

Bagged Ice Cools Milk

Here's a novel, yet effective way to refrigerate cases of milk during truck-delivery. Perforated bags (20 lb. capacity), made of two-layers of wet-strength, water-repellent, kraft paper

SIFT finer-faster-cleaner with DAY ro-balls



A few of more than 180 DAY ro-ball sifters in operation at a large midwestern plant.

Today thousands of products wet or dry, from flour to wood chips, are sifted through efficient, low-cost, high-production DAY ro-ball sifters. Superbly engineered, built for trouble-free operation under the severest service conditions, they insure longer life with lower maintenance costs.

The exclusive super active ball cleaning device provides rebound points in each ball compartment, assuring fast, thorough sifting of your product. Gyrating action brings material into constant contact with every square inch of screen surface. A stabilizer maintains screen in horizontal position and insures smooth operation.

DAY standard ro-ball, available in six sizes, single or multiple screens. Single screen models in stock.

Stainless steel units available to meet food and dairy sanitary codes.

Many models are available so it is easy to choose one which will exactly suit your requirements. They can be used separately or in combination with DAY mixers or blenders to save product handling. A completely equipped lab is available for testing your product.

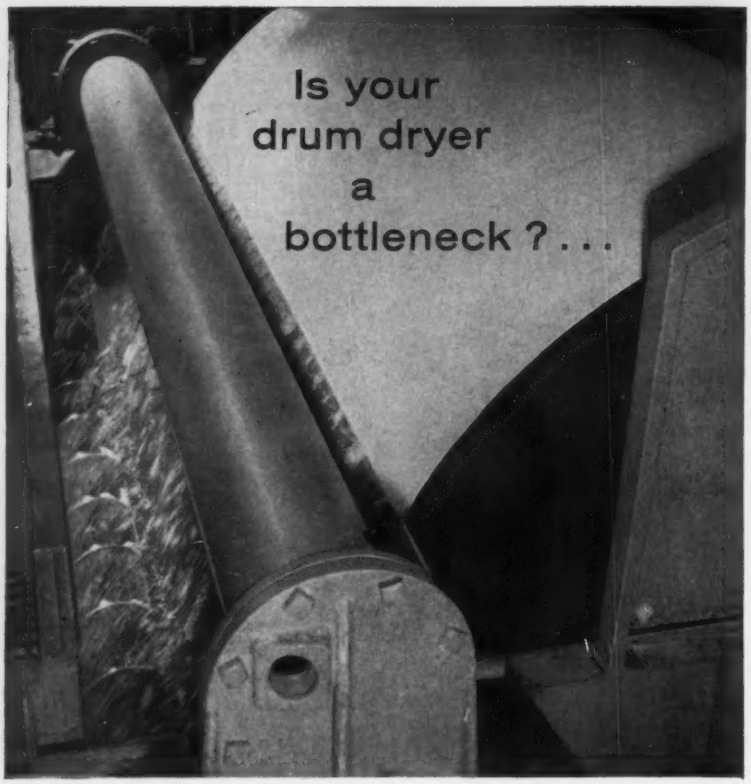
Write for new DAY ro-ball Bulletin.

The **J. H. DAY** *Co.*

Division of The Cleveland Automatic Machine Co.

SERVING THE PROCESS INDUSTRY SINCE 1887

4924 Beech Street, Cincinnati 12, Ohio



Use RHOZYME Diastatic Enzymes

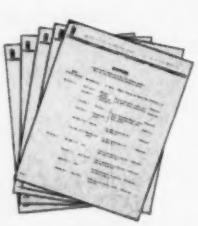
If you process cereal grains or other starch foods, would you like to increase production several-fold with your existing plant equipment?—Do it with RHOZYME Diastatic Enzymes. RHOZYME action on cooked starches lowers their viscosity. Less water is required to process a given weight of solids, and since your dryers have less water to evaporate, their capacity is substantially increased. Also, the saccharifying action of the enzyme makes your cereal sweeter, and the volume of fines in the dried product is reduced.

In addition to aiding the processing of cereals, RHOZYME enzymes are particularly valuable in: *Production of Corn Sirup*—by saccharifying corn starch to make sweet, non-bitter sirups . . . *Production of Cocoa Sirups*—by lowering viscosity and eliminating set-back, so that sirups pour more readily . . . *Bread Making*—by modifying bread starch for better texture, grain, and shelf life . . . *Sugar Recovery from Candy Scrap*—by reducing the viscosity of the starch content; this permits efficient flavor and color removal at higher solids levels.

Chemicals for Industry

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

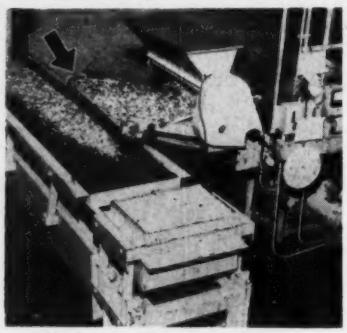


RHOZYME *is a trademark, Reg. U.S. Pat. Off. and in principal foreign countries.*

Write Department SP-4 for technical notes.

Practical Ideas

(Union Bag-Camp) are filled with ice and placed on top of stacked cases. Perforations act as drains to disperse the cold icewater over the bottles.—*FE Staff*



Vibrator Serves 3-Conveyors

We utilize one of our cookers for processing four different products. These are moved to packaging areas by three take-away belts, located adjacent to cooker's out-end.

Since only one product is cooked at a time, our machine shop devised this portable, vibrating conveyor (arrow in photo) to transport products from cooker to take-away belts.

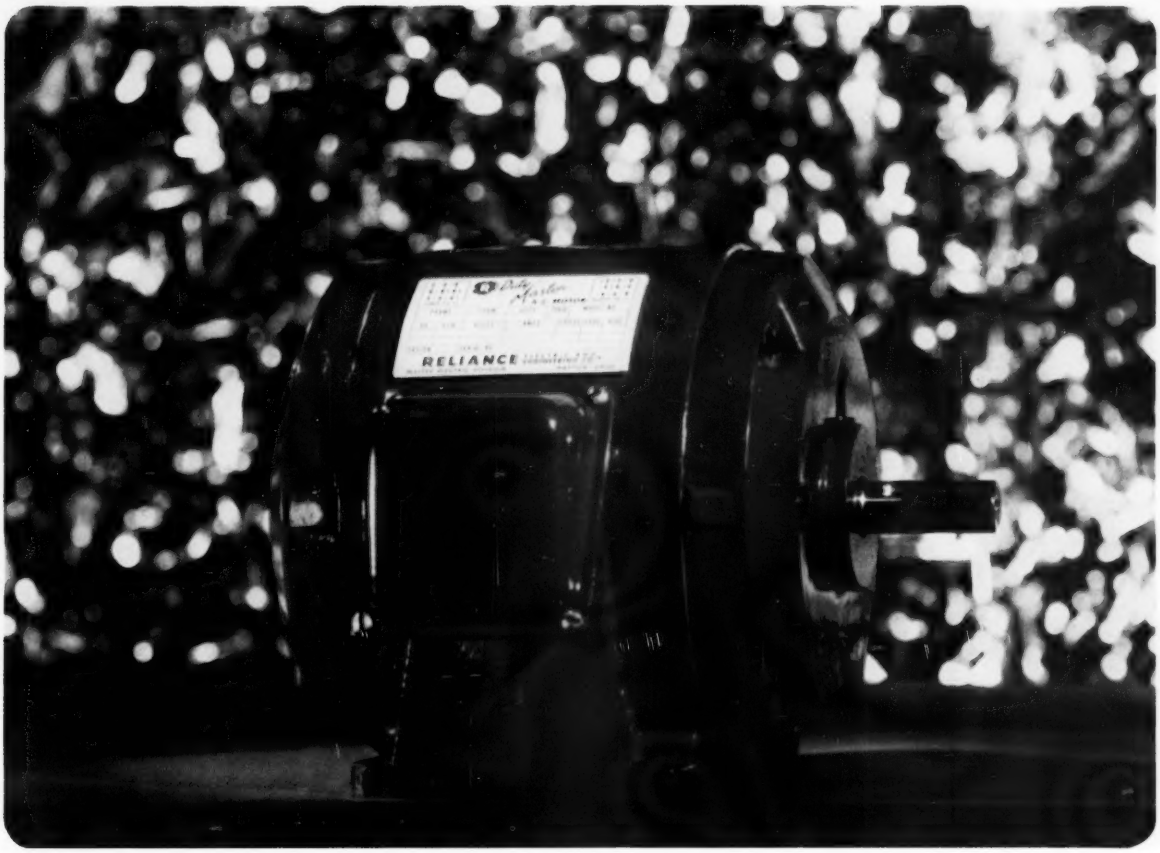
Vibrator-pan is supported by four leaf-springs. Vibration is achieved by a Shaler Shaker (driven by a ½-hp. motor) which actuates a horizontal shaft attached to base of pan. In operation, angled leaf-springs impart upward and forward motion to product. Unit is mounted on four 4-in. swivel-and-locking castors.

Beside savings from substituting one conveyor for three, it conserves floor-space and its pan is much easier cleaned than a belt.—*H. W. Lay & Co., Inc., Atlanta, Ga.*

PRACTICAL TIPS

Where corrosive fumes from a manufacturing process can be confined to only a few rooms of curtain wall construction, consider stainless steel walling. Panels now are available with stainless on one or both sides.

Packing-strip saving. The aluminum bronze packing-strips of our A-B cookers (12 for each unit) are replaced twice each season. Formerly, they were purchased cut to order. But last season we bought No. 15 Amco aluminum bronze, then cut it to proper lengths—at a saving of $3.40 per strip.—*"Nibletter," Green Giant Co.*



a brand new A-c. motor

the DUTY MASTER

A completely new motor produced by The Reliance Electric and Engineering Company and its Master Electric Division. Duty Master offers built-in protection, simplified lubrication and improved performance.

Duty Master shows that all motors are not alike, see next page for details.

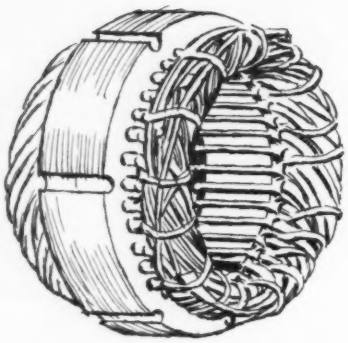
Available now from stock, 1 thru 250 hp. in all enclosures.

RELIANCE : **MASTER**

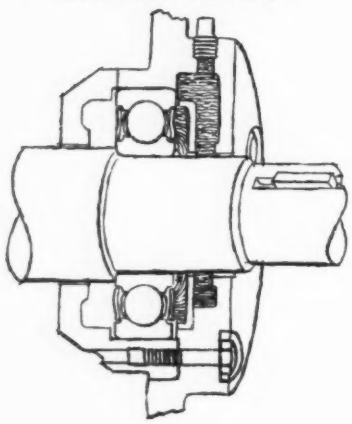
ELECTRIC AND ENGINEERING COMPANY : ELECTRIC COMPANY DIVISION

Earl C. Barnes, Chief Engineer

"Duty Master is built to last from the inside out."



PROTECTED WINDINGS



METERMATIC LUBRICATION

"Built-in protection was the aim in designing the Duty Master. From the steel core to the cast iron frame, everything possible has been done to insure long life under severe operating conditions.

"The insulation is moisture-proof and acid-resistant. Windings are thoroughly dried, pre-heated and impregnated with multiple dips in thermosetting varnish, and finally given a sealing coat of finishing enamel.

" 'Metermatic' bearing lubrication fits any plant lubrication schedule. Motor bearings are lubricated constantly from a large reservoir. A metering plate feeds measured amounts of grease to the bearing as required. The reservoir and automatic grease relief along the shaft make it impossible to over or under grease the Duty Master.

"Whatever your requirements, Duty Master gives you extra built-in protection and longer motor life." *Earl C. Barnes*

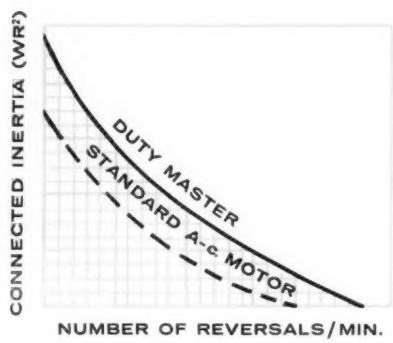
RELIANCE — **Duty Master**

A-C. MOTOR

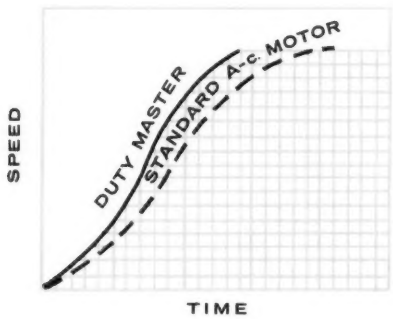
Dr. C. G. Veinott, Chief A-c. Design Engineer

"Duty Master's electrical design provides improved operating characteristics."

REVERSAL



ACCELERATION

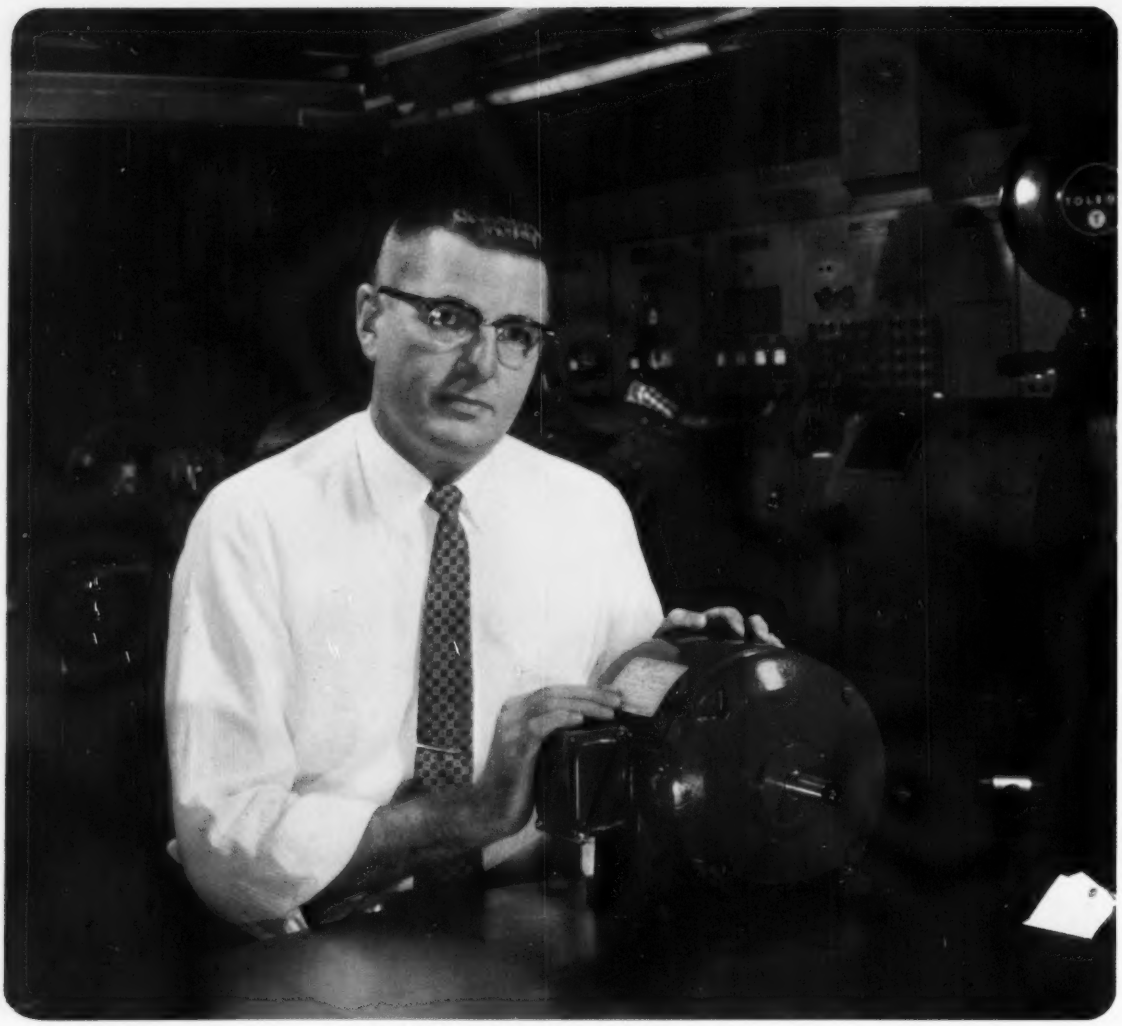


"The electrical design of the Duty Master was thoroughly analyzed through the use of digital computors. The purpose of this specialized work was to produce a motor with maximum operating characteristics and maximum efficiency.

"The most visible result of the extensive computor program is the new low inertia rotor. The rotor, like the rest of the Duty Master, takes advantage of new materials and techniques. This rotor, plus better ventilation and other refinements, gives a definite improvement in acceleration, reversals and start-stop performance.

"This is just one example of many mechanical and electrical design changes that make Duty Master a new motor, not just a face lifting." *Dr. C. G. Veinott*

RELIANCE-R Duty Master
A-C. MOTOR



John Walker, Manufacturing Manager

"Manufacturing quality and deliveries are emphasized for Duty Master."

"A motor design is no better than the finished product. That is why we lay particular emphasis on experienced plant people and top quality materials.

"New automatic winders, annealing furnaces, conveyor systems, turning and welding equipment are another part of the quality picture. Equally important is proper scheduling to deliver the motor on time. The new Duty Master is not only an exceptionally good motor, it is an available motor, ready for delivery without unwarranted delay." *John Walker*

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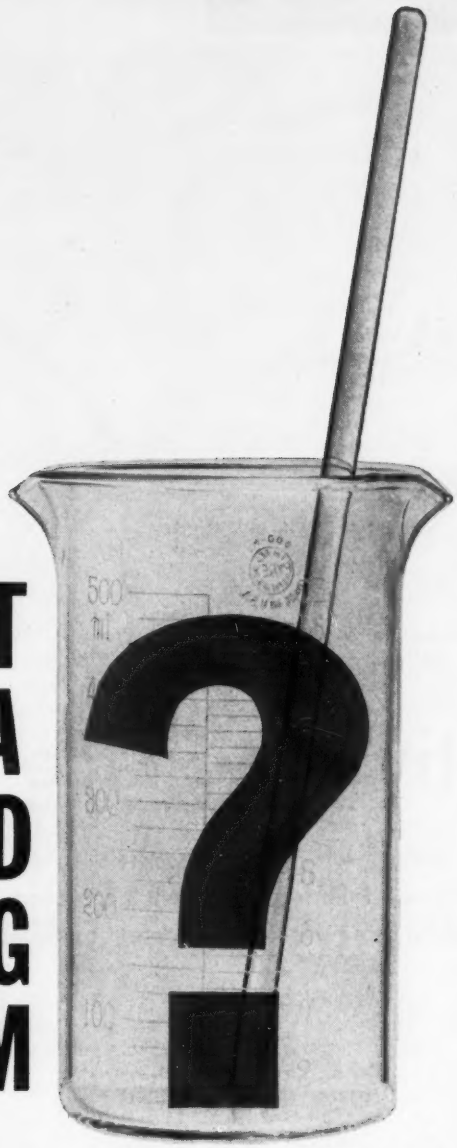

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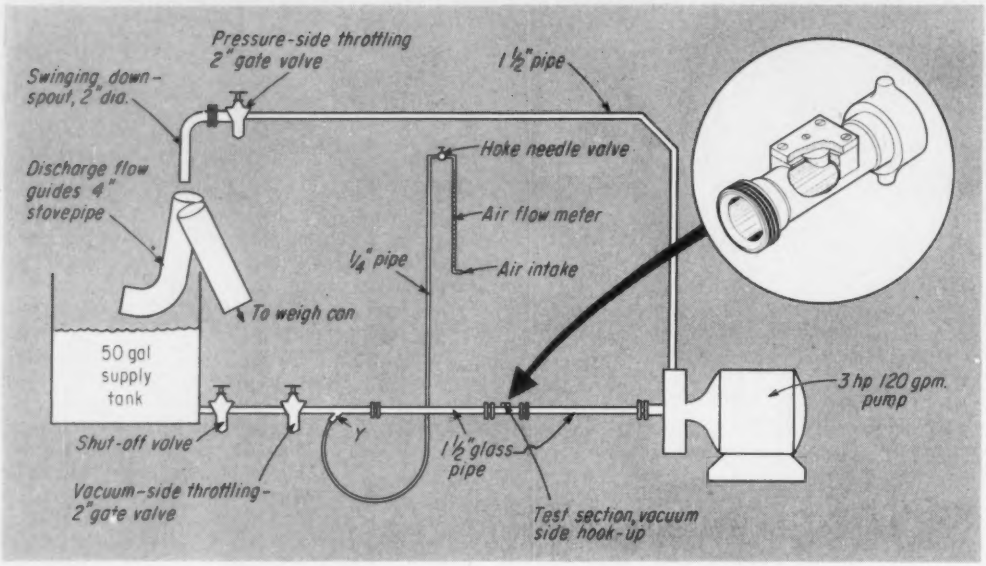
CIRCLE 97 ON READER SERVICE CARD 97



APPARATUS was designed to enable insertion of test section (detailed in inset) on either pressure or vacuum side of pump, and to assess effect of air leaks in lines.

Effective In-Place Cleaning

Studies reveal role of 5 factors—time, temperature, turbulence, detergent concentration and composition, mineral content of water

THE GENERAL SWING away from rubber-booted, brush-wielding clean-up crews to in-place cleaning has brought about a small-scale industrial revolution in food plants.

But because usage has grown faster than understanding of the basic principles involved, mistakes have been and are still being made.

True, food processors, sanitarians, equipment manufacturers, and detergent companies have evolved a few rules of thumb in an effort to help develop this fast-moving field. But the major bottleneck is a lack both of clear understanding of the principles involved and a knowledge of the effect of certain variables.

Since evaluation of these variables requires the cleaning process to be stopped short of completion, processing plants are not well suited for such studies. At the most, commercial operators can establish minimal conditions for satisfactory cleaning. But it is almost impossible to evaluate a single variable properly under such restrictions.

In an effort to fill this void, research on circulation cleaning has been conducted at U. of California for several years. So far, the study has been restricted to removal of milk films, but results lead to general conclusions that should be directly applicable to other types of soil.

WALTER G. JENNINGS

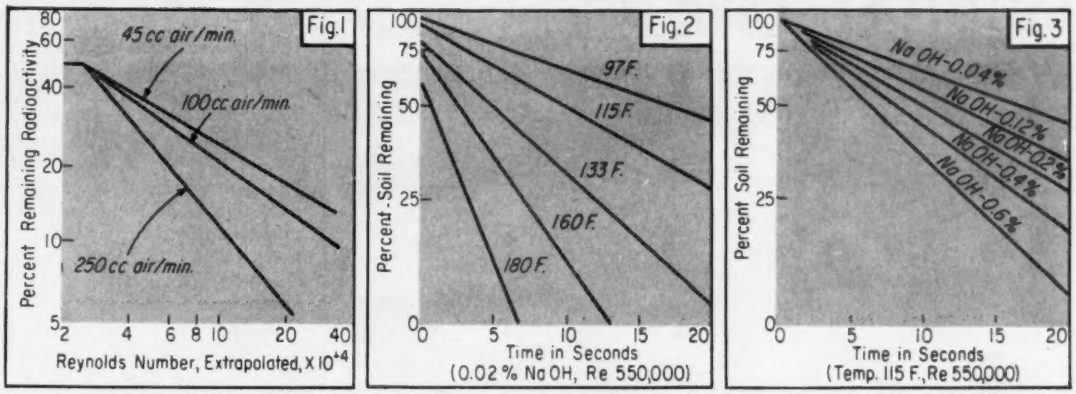
Dept. Food Science and Technology, U. of California, Davis

Tracers Aid Studies

Evaluation of a cleaning regime requires measurement of the amount of soil removed by a certain treatment in a given period. This is not easy, and visual inspection is certainly inadequate. Attempts to stain the soil film remaining on the equipment surface and measure the amount of bound color with reflectance photometers or similar instruments have not proved satisfactory. Likewise, bacterial swab techniques —determining number of viable bacteria by scrubbing a given surface area with a sterile swab after equipment has been cleaned—have their limitations. For it is widely recognized that equipment can show a low swab count and still possess considerable "sterile filth".

Of several methods investigated in this laboratory, one that gave satisfactory results was use of radioactive tracers — adding radioactive phosphorous P^{32} to a standard soil, and following its removal by decrease in radioactivity.

Because the tracer was added as an inorganic salt, there was a possibility that it would leave organic residues unlabeled and thus prove unsatisfactory as an index of total residues. To check this, trials were made on films from milk: (a) To which inorganic tracer had been added, (b) from a cow receiving an intravenous jugular injection of P^{32}. In latter case, the phospholipids associated with the fat, and phosphoproteins (by far the major protein fraction), as well as the inorganic phosphates, were radioactive.[1] Since no differences were detected, it was concluded that addition of the radioisotope gave a suitable index of both organic and inorganic residues.



CLEANING EFFECTIVENESS is influenced by numerous factors. Fig. 1. Air exerts scrubbing action. Fig. 2. Increasing temperature speeds cleaning. Fig. 3. Detergent concentration ups soil removal.

Another difficulty was design of a suitable test strip. Such a strip should reflect conditions at surface of equipment, not within body of circulating fluid.

Since the major equipment item subjected to circulation cleaning is pipelines, which fortunately are well suited to experimental study, a section of 1½ in. stainless tubing was constructed to receive stainless test inserts, milled and honed in place (inset in diagram). Two-foot sections of 1½ in. glass pipe were attached to ends of test section, and the test unit was arranged to permit operation of this section on either pressure or vacuum side (diagram opposite page).

Test disks were inserted in rubber-bell reducers attached to short pieces of a large can. When can was inverted over steam jet, disks formed bottoms of miniature pasteurizing vats. One-half cc. of radio-active milk was placed in each "vat," and steam applied. Initially, disks were steamed almost to dryness and the last drop decanted, but more reproducible results were obtained when disks were steamed until completely dry.

5 Factors Involved

Most cleaning programs can be divided into three phases: (1) Displacing soil from equipment surface; (2) dispersing this soil in deterging medium and preventing its redeposition, and (3) flushing dispersed soil and detergent out of equipment. Each of these steps requires a certain energy input. Demands of first two can be decreased by careful selection of detergents. Even so, most of the energy is usually expended on the first step.

Until recently, the most general method of energy input was manual application of a bristle brush. But in circulation cleaning, it takes the form of friction between deposited soil and the fluid flowing past it. The effect, usually attributed to velocity, is probably a frictional one best described by turbulence of the fluid. While this is a function of velocity, it is also influenced by such factors as diameter of pipe and temperature of solution.

The engineer uses a "Reynolds number" (Re) to describe turbulence, and has a formula for calculating its values.[3] Most authorities agree that fully turbulent conditions occur at Re 14,000. But analysis of experimental data, showed that plots of soil remaining on test disks as a function of Reynolds number were best satisfied by two straight lines intersecting at about Re 25,000. This means that turbulence doesn't contribute very much, until one achieves Re 25,000, equivalent to a velocity of 1.3 ft./sec. in a 1½ in. line, and twice this fast in a 2 in. diameter line.

Changes in temperature or composition of deterging medium would alter these values, but it can be assumed that, once a minimal condition is satisfied, increased turbulence pays handsome dividends.

Where the fluid flows through sections of larger diameter (and in dead-end pockets), its velocity is much decreased and flow conditions are affected. Here circulation cleaning is often unsatisfactory. These sections should be inspected regularly, and may require frequent hand cleaning following this disassembly.

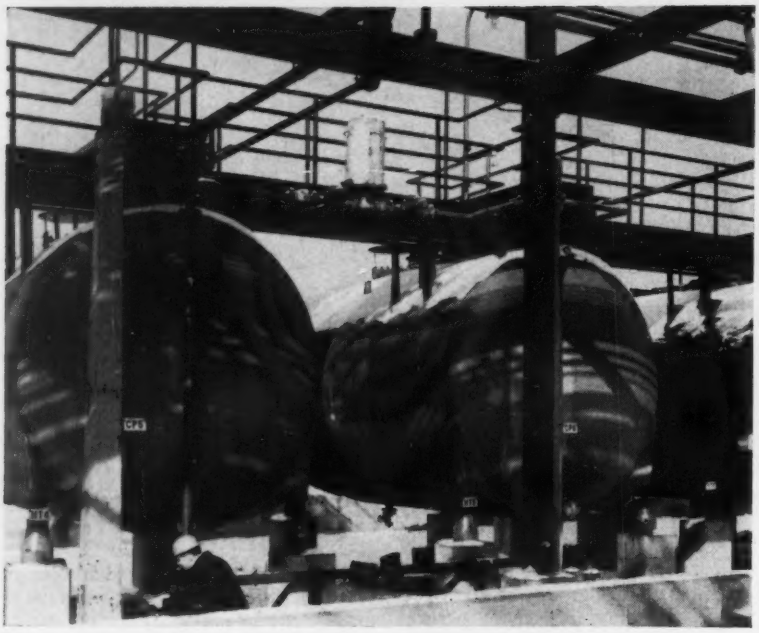
Air can be present in three forms: (1) Dissolved; (2) occluded bubbles or slugs, and (3) foam. In certain pieces of apparatus designed for in-place cleaning, some areas do not operate under flooded conditions. To insure that the cleaning solution contacts such areas, foaming agents are frequently added. This causes a foam buildup that contacts otherwise-stagnant areas, but under conditions of minimal turbulence. As foam builds it exerts a cushioning effect, acting as a buffer between the solution and surface that actually inhibits cleaning.

Influence of Air

Realization that good circulation cleaning requires pumping large volumes of solution has led to the erroneous belief that there should be a positive pressure within the system. Actually, a cleaning job is better when the equipment is on the suction side, with the pump positioned to pull the solution through it.[3] Where air can be bled into a system without causing a deleterious build up of foam, it assists cleaning. Slugs of unincorporated air and occluded bubbles exert a scrubbing action on surfaces (Fig. 1).

Temperature is one of the more difficult variables to evaluate. However, chemical kinetics have provided a promising approach. The chemist frequently uses a mathematical expression to describe speed of reaction between two materials, and a similar type expression can be set up to describe rate of soil removal by a detergent.[4] Temperature can be evaluated precisely by observing its

FLUIDICS* at work



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effect on the expression, (Fig. 2). For example, when 0.2% solutions of sodium hydroxide were used to clean milk films, cleaning was five times as fast at 180 as at 115F.

Concentration of detergent exercises an effect on rate of soil removal provided it is in solution. (Fig. 3). And when these data in were treated mathematically, it turned out that water, far from being inert, played the major role in cleaning.

Detergent composition is probably more important in circulation cleaning than in conventional hand clean-up since deposits left by unsuitable cleaners or incompatible detergent fractions can cause the processor using in-place cleaning trouble before he realizes that a problem exists.

A special problem confronting many dairies is copper pickup when discarded white metal lines are used for solution return. This can lead to an abnormally high copper content in the first milk through the cleaned system.[5]

Another problem develops when the wash water contains large amounts of iron, manganese, or certain other metals. Here, a brown deposit sometimes appears in the solution return line, though not in the milk lines. This can usually be controlled by adding a chelating agent, such as ethylenediamine tetraacetic acid, to the detergent. Milk itself possesses sufficient chelating power to prevent these deposits in the milk lines. Alternatively, an ion-exchange water softener would be beneficial, but economics of its installation would probably vary with each case.

The above factors—time, temperature, turbulence, detergent concentration and composition, and water composition—all enter the cleaning equation. It is hoped that data on them can ultimately be extended to provide tables for determining what detergents best remove specific soils, and for estimating the economics of balancing the various factors in order to achieve maximum results at minimum cost.

References

1. Aten., A. H. W., Jr., and Kevesy, G. Formation of Milk. *Nature* 142, 111, 1938.
2. Jennings, W. G., McKillop, A. A., and Luick, J. R. Circulation Cleaning. *J. Dairy Science* 40, 1471, 1957.
3. Jennings, W. G. Circulation Cleaning, II. Effects of Entrained Air. *J. Dairy Science* 42, 476, 1959.
4. Jennings, W. G. Circulation Cleaning III. The Kinetics of a Simple Detergent System. (In Press).
5. Dunley, W. L., and King, R. L. Adsorption of Copper on Stainless Steel. *J. Dairy Science* 42, 480, 1959.

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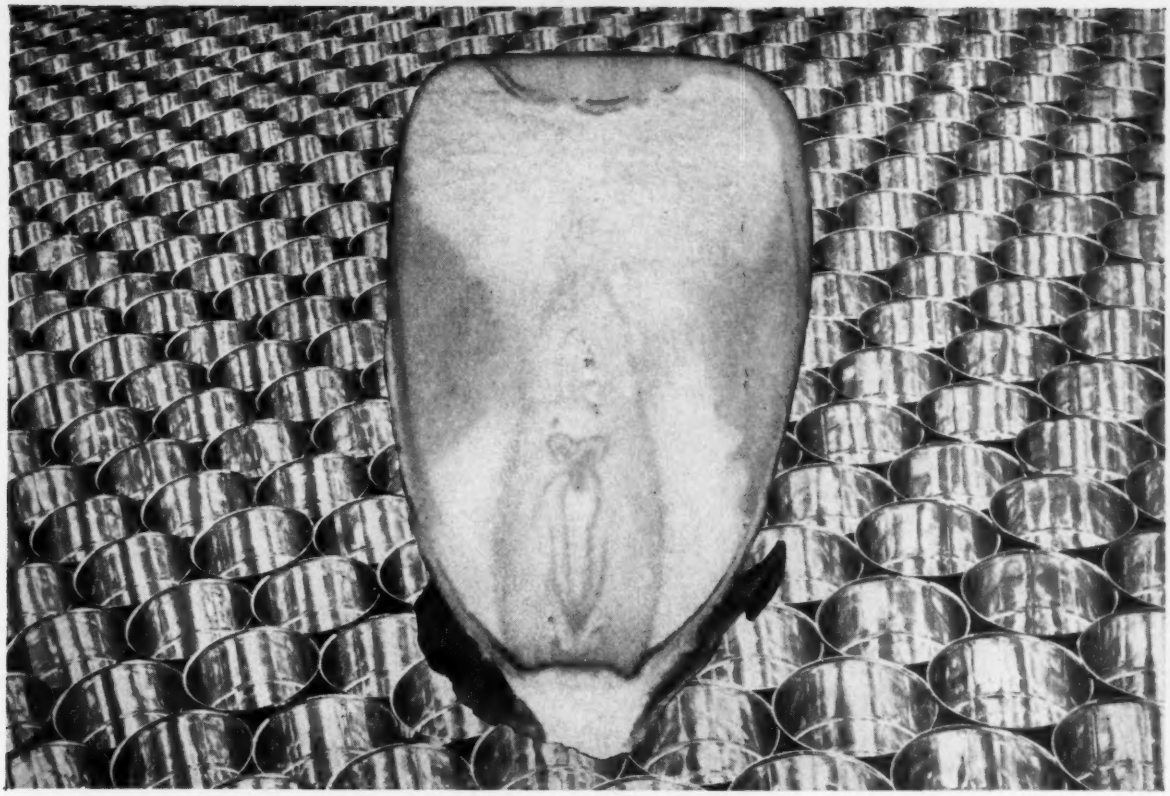

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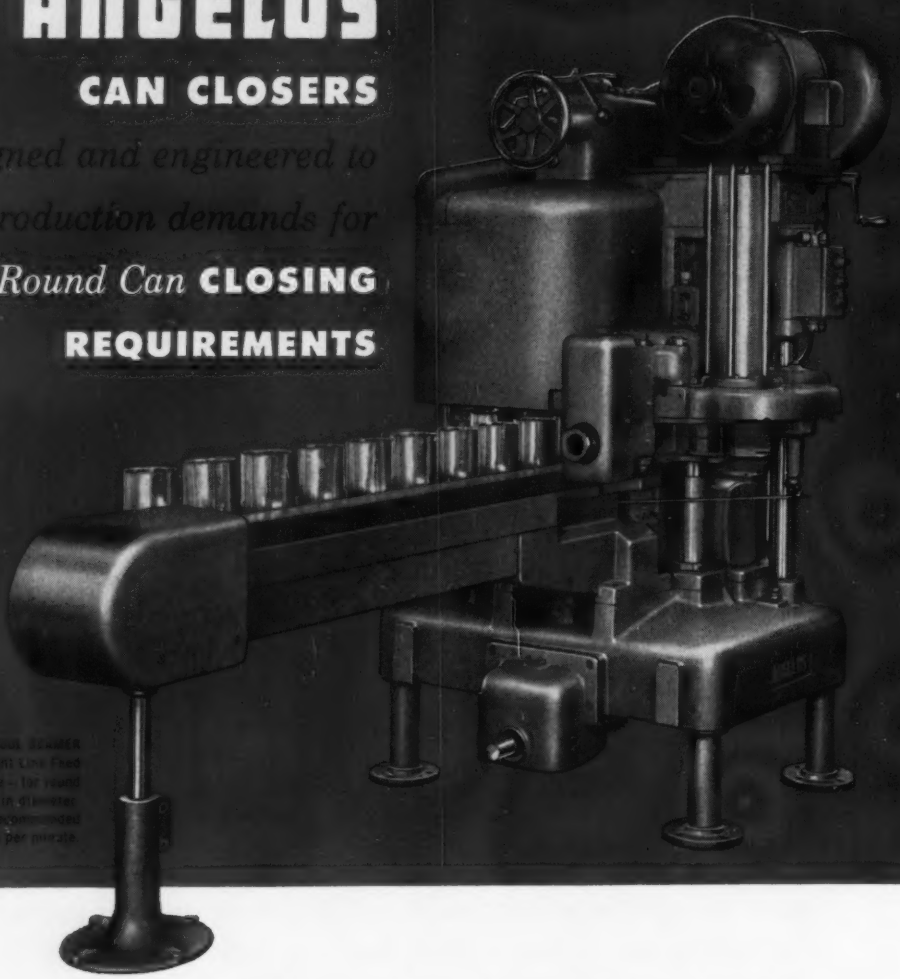

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See Multi Benefits in New Malts

Searching studies uncover striking ingredient potentials for these versatile agents—in nutrition, preservation, flavoring, coloring . . . Various commercial types compared, applications cited

FOR CENTURIES, malt's enzymatic capability has been known and put to use. But only now are researchers intensively probing the full potential of this versatile material for process and product improvement.

True, malt is still used principally as a source of both extractives and diastatic activity in brewing, and as a diastatic supplement (in distilling and baking) for converting starches to sugars prior to fermentation. And here, scientific know-how continues to extend our control of the enzymes developed during malting.

But aside from this diastatic activity, malt offers the food processor many valuable properties as an ingredient. In fact, its growing acceptance both as a flavoring and coloring agent—also as a nutritious food in its own right—may well be just the initial recognition of its true value.

Thus, expanding the use of malt as a food ingredient is a prime object of present research at malt laboratories. And these studies are already turning up numerous potential uses.

WILLIAM J. OLSON

Director of Research, The Fleischmann Malting Co., Chicago

One in particular may prove highly significant: Recent findings indicate that malt flour has a food-preserving effect (imparts oxidative stability) beyond that attributable to its antioxidant properties. Fats thus treated ultimately reach a peroxide level where one would expect them to be rancid. Yet they aren't.

In contrast, fats stabilized with other antioxidants do smell rancid at these peroxide values.

The substances in malt responsible for this effect have not as yet been determined, but indications are that they are reductones that will stabilize a wide variety of foods.

For example, potato chips may be kept in excellent condition for over three months when malt preservative is surface-applied (¾ to 2 oz. per lb. of chips).

It's a Natural

Also of considerable importance to processors is the fact that malt is a natural food ingredient—rather than a chemical additive that may require extensive toxicological studies to prove its safety.

In addition to its enzymatic uses in brewing and baking, malt is now finding greater applications as a food ingredient, stemming from these four significant factors:

1. **Derived from a nutritious cereal (barley), malt has high nutriment and retains all these values after processing.**
2. **Once malted, it is no longer a raw grain and may be consumed as a palatable cereal.**
3. **Enzymes in malt can modify other food ingredients.**
4. **Malt can be tailored to impart a wide range of colors and flavors.**

These are its major ingredient applications today:

In infant foods. Here malt is a preferred element because it provides simple sugars that are easily absorbed by the digestive system. Furthermore, enzymes present aid in converting complex food into simple ones that the infant can easily assimilate.

In malted milks. Provided by malt is a pre-digestive quality particularly favorable for infants, invalids, and growing children. In addition, these milks afford quick energy for adults.

Large amounts of malted milks go into soda fountain drinks, home beverages, and confections. They are a good source of mineral salts, vitamin A, and vitamins of the B complex.

(*Turn page*)

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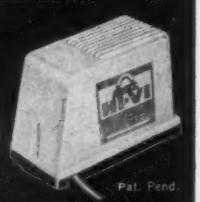

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Cereal proteins originally present are partially digested during malting.

In a miscellany of other items. These include baked goods, breakfast cereals, vinegar, coffee substitutes, and high-protein rations.

What Malt Is . . . Types Supplied

This agent is the product of a controlled partial germination of barley. During this malting process, amylolytic enzymes (essential to starch conversion) are released. After germination, the product is dried.

Malt may be ground to a fine flour or, as in brewing, into small grits. Although somewhat darker in color than the barley itself, malt may be brightened considerably by sulfur dioxide treatment during kilning (drying).

Data on chemical composition of malt (see accompanying table) generally refer to brewers' malts, and are necessarily only approximations since malt composition varies with barley variety, berry size, and malting procedure.

For use as a food flavoring and coloring agent, malt is available as a sweet, viscous liquid containing dextrin, maltose, some glucose, and an amylolytic enzyme. Color darkness is controlled by roasting the malted barley.

The different kinds of malt are produced mainly by varying germination conditions and the severity of drying. In general, the more severe the kilning,

COMPOSITION of Typical Brewers Malt

Item	% Dry Weight
Moisture	4.0–10.0
Digestible protein	7.0–12.0
Total digestible nutrients	80.0–85.0
Total protein (N x 6.25)	11.5–14.5
Fat	1.5– 2.5
Nitrogen-free extract	68.0–74.0
Ash	2.0– 3.0
Fiber	2.0– 6.0

the lower the enzyme content and the higher the extract color, also the greater the development of flavor and aroma.

The latter three properties generally are attributed to formulation of melanoidins from condensation of sugars with amines, amino acids, or polypeptides during kilning. Here are the various products, in order of severity of drying:

Distillers' type malts, kilned at temperatures not exceeding about 150F.

Brewers' malts, kilned at 120F. and finished at 180F. High heat treatment lowers diastatic power to 90-150 deg. Lintner (a measure of amylase activity), and alpha amylase to 20-38. Soluble protein and percent soluble solids are considerably lower than in distillers' malts.

Wort color of brewers' malts ranges 1.5 to 3.0 deg. Lovibond, which is higher than the distillers'. Correspondingly, flavor and aroma are increased. Moisture of brewers' malts after kilning is around 4%. Both barley variety and berry size may influence chemical composition of malts, although they are malted in the same manner.

Brewers' high-dried malt (Munich Malt), specified when a malt of greater color, aroma, and flavor is desired. It is kilned (at temperatures ranging to final heat treatment) at 220F. Diastatic power and alpha amylase activity are lowered, moisture is about 3%, wort color ranges 3 to 10 deg. Lovibond, and flavor and aroma are increased.

Dextrin malt, heated to 200F. and finally dried at 175F. Its starch is gelatinized (as a result of high heat treatment) while moisture content is still high. Diastatic power and alpha amylase activities are largely destroyed. Wort color depends upon length of heat treatment, and may remain as low as that of brewers' malts. Or it may be increased to 10, as in high-dried malts.

Caramel malts prepared when high color, flavor, and aroma are desired instead of amylase activity. Immediately after germination, green malt is roasted at 240F., which saccharifies the starch and causes the kernel to become brittle and glossy. Little or no diastatic activity remains. Moisture (after kilning) is reduced to about 2%, but increases fairly rapidly upon storage.

These malts are classified by wort color as very pale, pale, regular, and dark (differences that depend upon length of roasting).

Black malt. This is merely barley roasted until it is black and has a wort color of about 100 deg. Lovibond. Initially, moistures may be as low as 1%, but they rapidly increase. No diastatic power remains. It's used as a coffee substitute or extender.

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Cost in Use	Low, but require frequent application.	High	Very low.
Odor	Heavy and penetrating.	None	Very light and non-lingering.
Cleaning Ability	None, cause bleaching.	Poor, inactivated by soaps.	Good
Microbiology	Selective germicide. Will not destroy a wide range of organisms.	Selective germicide. Will not destroy a wide range of organisms.	A nonselective germicide. Kills bacteria, virus, molds, fungi, yeast, spores, etc.
Affected by Hard Water	No	Yes	No
Indicator of Bacterial Efficiency	None	None	Color
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Toxicity	Yes	Variable	No

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"PUT TO SLEEP" in Hormel-developed CO_2 gas chamber, hogs are ready for easy belt-level shackling and quiet, controlled sticking and bleeding.

FE Roundup:

Humane Slaughter Gets Rolling

COMPROMISES are often disparaged. But in truth the best compromise of all factors of a problem can lead to the most satisfactory solution.

Case in point is the enactment last year of humane slaughter legislation, long sought by humanitarian interests. Until then, this movement was being deflected by packers, primarily on economical grounds.

Emotions had run high, brought into public focus by the humane societies. Packers, however, were willing to go along–given an inexpensive method adaptable even to small slaughterhouses.

As to be expected, a number of responsible people had come up with a number of working ideas and some partial developments. Logical follow-up, then, was weighing of the various possibilities–to arrive at an optimum for all parties.

Simplest approach lay in a check of the pros and cons. And this was arranged when Secretary Ezra Benson named an advisory committee to work with USDA toward new and improved methods of humane slaughter. Represented on the body were meat packers, livestock growers, the poultry field, humane organizations, trade unions, veterinary-medical groups, religious faiths, and the general public.

The committee has sparked research and fostered cooperation. It still meets at least once a year and, at the call of the Secretary of Agriculture, submits its findings relative to techniques.

Packers pledged cooperation in supplying USDA with information on their developments. And they're still continuing to search out methods and modifications likely to be better, cheaper, and more practical.

The four ways approved by USDA early this year are electrical stunning, mechanical-bolt stunning, carbon dioxide immobilizing, and gunshot–as contrasted with the conventional methods that involve knocking cattle unconscious with a hammer and hoisting shackled hogs before slitting their throats.

Aim of the law was to: (1) Prevent needless suffering by livestock during slaughter, (2) provide safer and better working conditions for those engaged in slaughtering operations, (3) improve products, and (4) range possible economies and other benefits, from producers to consumers.

Except for Jewish ritual slaughter (considered humane), an estimated 15 slaughter plants must convert to one or more of the accepted methods before July 1, 1960 if they intend to sell to a Government agency. Otherwise, the law carries no penalty.

Action by the states, however, is something else. As this article was written, two states–Minnesota and Washington–had enacted humane slaughtering laws. That of the latter state is illustrative: It sets a penalty of 90 days' imprisonment, $500 fine, or both (effective July 1, 1960) for manual hammer-or-sledge slaughtering.

Meanwhile, at least seven other states have made moves–

California: Upper house has passed bill intended to effect coverage of meat going to state institutions . . . Michigan: Bill in committee . . . Missouri: Bill in committee . . . New Hampshire: House has passed bill for law that would be effective in Janu-

PENETRATING TYPE captive-bolt incorporated in this pistol is propelled by explosive cartridge. Pistol costs $100, cartridges 2½¢ each.

PNEUMATIC GUN utilizes compressed air to drive penetrating, retracting pin into animal's skull. Where necessary, it can be refired instantly.

• Advisory committee sparks action . . . • Packers contribute . . . • Tenets and targets of approved methods . . . • Significant developments on the state level . . . • Close focus on equipment, costs and benefits

ary . . . New Jersey: Public hearing conducted on the Assembly bill introduced last January . . . Ohio: Developments seen leading toward a law in a couple of years . . . Wisconsin: Upper house has passed bill for law aimed to become effective next January.

To Go Back a Bit—

Initial moves came early in the century when humane societies invoked local anti-cruelty-to-animals laws to curb brutal handling of food animals. Then, in the mid-'30s, the societies began proposing specific laws. There was pressuring of Congressmen and the public, with grim picturing of the worst aspects of slaughtering.

The packers reacted. They were against having laws jammed down their throats before they had sufficient time to investigate, develop methods, and report their findings.

Sought by the packers were humane methods that could be carried out cheaply. They feared being forced into techniques that would unnecessarily up costs for all concerned.

Soon, a variety of methods, both foreign and domestic, were put under scrutiny. Here, there was particular attention to the possibilities of mechanical-bolt and electrical stunning. Trouble with the latter (and reason USDA was then against it) was a difficult problem it posed relative to meat inspections: The electric jolt suddenly raised blood pressure, burst capillaries in the animals' lungs. Resulting were hard-to-detect internal lesions and the likelihood of condemning more animals. As will be told, however, this problem is being resolved by greater care in the operations.

Gas Immobilizer

In the meantime, Hormel developed its CO_2 hog-immobolizing system[*]—a contribution to humane practices, efficient plant operation, improved working conditions, and better product quality.

This system—which won FE's 1953 technology achievement award—is further cited as eliminating chronic shortages, improving bleeding and saving blood, reducing bloody trimmings and damaged shoulders, and releasing workers for other tasks. The rate is 600 hogs per hour.

Thus far, there's no other USDA-approved method that handles these animals as efficiently, as economically, and with less labor. Hormel's experience, dating back to '52, indicates no operational problems with this method.

In practice, the hogs travel through a tunnel where CO_2 renders them unconscious for about 20 sec. They are then stuck quickly after emerging. Simple design minimizes maintenance. Special mechanisms direct the hogs onto the continuous gas-tunnel conveyor, and the CO_2 control equipment includes facilities for graphically recording gas concentrations and exposure times.

Outlay runs $25,600 for the smallest unit, $42,120 for the largest. These figures include a fixed royalty (based on speed at which immobilizer is to be operated). Cost of CO_2 is put at about 1¢ per hog. At present, there are 26 installations—14 in Europe, 11 in the U. S., and 1 in Canada.

Immobilizers are used, too, for sheep and calves. Also a USDA survey indicates a chicken-and-turkey potential. And tests on cattle also appear satisfactory. It's noted here that nitrogen gas is being studied as an immobilizer because it wouldn't have to be as carefully controlled as CO_2.

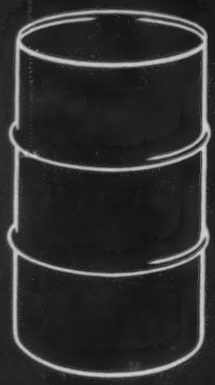
For packers running fewer hogs, alternatives are the less expensive electric stunning, mechanical-bolt stunning, or gunshot methods, which don't require radical plant changes. Where electrical stunning or air-operated mechanical bolts are used, costs are but a fraction of a cent per charge. Cartridge operation of bolts runs 3-4¢.

Additional ideas: Dazzling lights in knocking pens, which have an hypnotic immobilizing effect on animals during the second or two preceding stunning. Also tranquilizing drugs, which have been tested on slaughter-bound cattle to "precalm" them and so make them easier to handle. This fosters tenderer cuts.

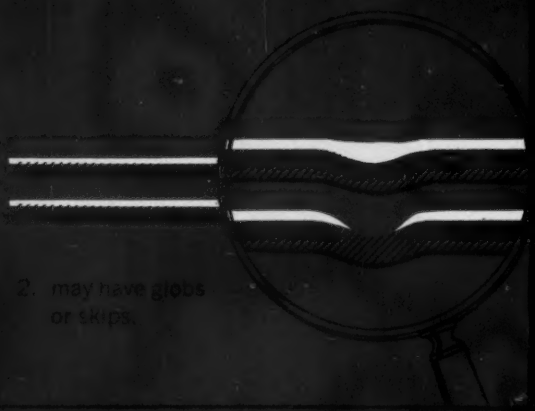
Widely used in Europe is electrical stunning, which is applicable for all animals. Cost of equipment isn't high—somewhere in the $500-$1,000 range.

Here, facilities to handle up to

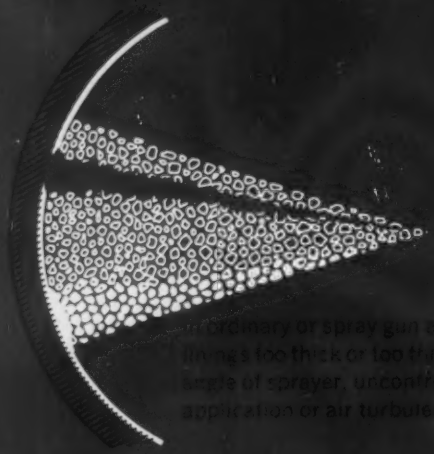
[*] See "References to Makers" at end of article.



1. The lined drums you buy

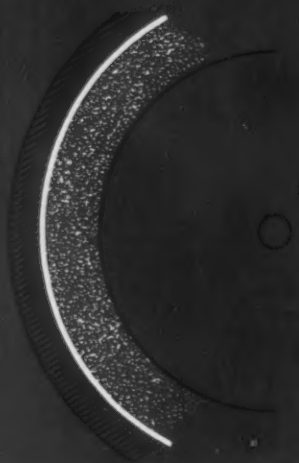


2. may have globs or skips.



3. Ordinary or spray gun application. Linings too thick or too thin result from angle of sprayer, uncontrolled rate of application or air turbulence.

4. Skips and globs may lead to contact between your product and bare steel, causing corrosion, contamination, customer complaints and costly losses.



5. With Rheem Centrifugal Spray, drum does not rotate. Lining quantity and application rate are controlled. The result:

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Rheem

60 hogs hourly call for an immobilizing pen (about 6 sq.ft. per hog), plus electrical stunning instrument operating from wall plug-in or battery. Unit comprises a pair of pointed electrodes. These are placed on animal's forehead, directly above the brain.

Regarding current, d.c. is advised, being the least severe in terms of animal reaction, and having less tendency to cause lung hemorrhages.

Electrical stunning has made shackling and sticking easier and safer. A calmer method, it's reduced animal squealing and made for less ham bruises. Overall, it's given a more dignified status to the operations.

Proved in Trials

Reliable Packing Co. experimentally employed a portable powered stunner on over 1,000 hogs without a single carcass being condemned by Chicago inspectors. Primal cuts from about 8½% of the electrically stunned animals were bonded out without evidence of hemorrhage or other damage—a contrast with the relatively high percentage of lungs condemned in earlier work.

Similarly, John Engelhorn & Sons, Newark, N. J., stunned 3,000 hogs electrically without an animal being condemned. Internal bruising was termed about 80% less than by the conventional method. Whereas in early experiments some lungs were condemned for petechiae (small discolorations in certain membranes due to forcing out of blood), incidence of these spots can now be minimized.

Engelhorn's setup comprises a 3x3½x40-ft. chute with the bottom of the last half incorporating a power belt moving to a foam rubber-covered squeeze box. This box has a movable wall (air-powered). It's activated by operator to restrain hog and lift animal's feet off belt.

The stunner's two needle-like electrodes are yoked on a wooden appliance having an insulated handle. Electrodes are applied to animal's forehead, whereupon a pushbutton activates the electric charge. Stunned animal is realeased from box onto conveyor traveling to shackling station.

Captive Bolts

A variety of mechanical-bolt devices is now offered for stunning hogs, sheep, calves, and cattle. Some are skull-penetrating, others non-

I. J. GRASS NOODLE CO.
DOUBLES PACKAGE PRODUCTION
with HAYSSEN COMPAK

The I. J. Grass Noodle Company, Chicago, Illinois, uses the above Hayssen Compak to automatically package their famous chicken and vegetable soup concentrates at continuous production speeds of 124 packages per minute. The 2¼" x 4" bag is a part of the complete dry soup package. This production rate is twice that of their former semi-automatic method and is accomplished with half the labor force. Another example of how you save with Compak.

Plant Superintendent William Fieroh has this to say about Compak:

- **HI SPEED** – Our Compak, on a regular two shift day produces 7,440 packages of concentrate at the rate of 124 packages per minute.
- **DEPENDABILITY** – The Hayssen Compak handles all films regardless of film variations in thickness or coating. Compak continues to produce high quality packages without nuisance adjustments or shutdown time throughout our two shifts.
- **ECONOMY** – A plus or minus 2 gram permissible variation is maintained with the Compak volumetric feed. This means minimum product waste, assures uniform product and continued customer satisfaction.

Let Hayssen help you with your automatic packaging problems. Write or call your nearest Hayssen office today!

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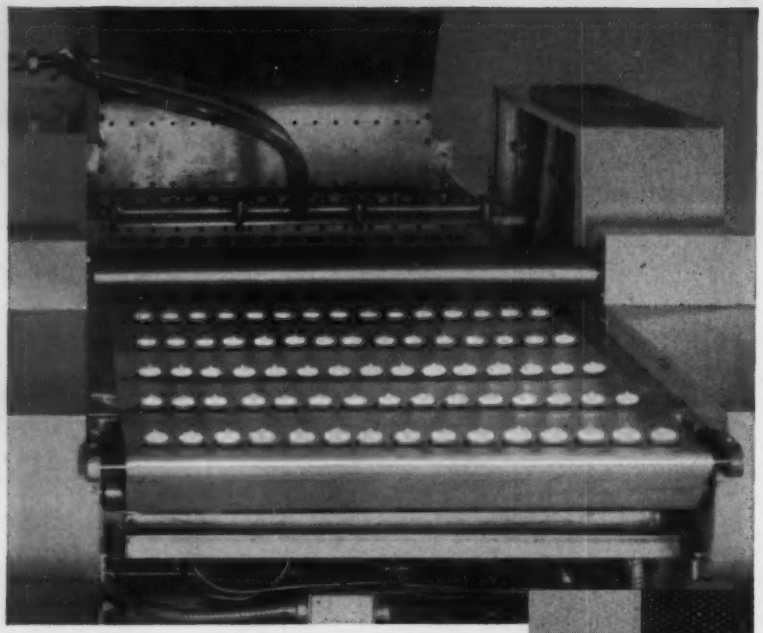
←CIRCLE 110 ON READER SERVICE CARD

CIRCLE 111 ON READER SERVICE CARD



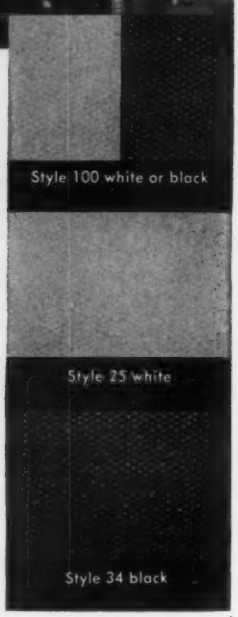
Why **Victor** Suprene Belting is your best choice for conveying—elevating —transmission

Victor Suprene is tightly woven of top-grade cotton duck, thoroughly impregnated with Victor's own exclusively developed Neoprene compound. It's this careful impregnation that produces Suprene's smooth, sanitary surface...seals the weave against small food particles...resists food acid, oils and moisture. And makes it so easy to clean with a hot water or steam wash.

Victor Suprene comes in three weights for conveying, elevating and power transmission jobs in the food industry; Style 100 in white or black for lightweight, small pulley, high performance operations...Style 25 in white for light to medium duty ...and Style 34 in black for those workhorse chores.

All three styles of all-purpose Victor Suprene Belting are available in a wide range of plies and widths. For complete specifications and prices of Victor Suprene Belting, write today for Circular 20.

1498



A COMPLETE LINE, including: Neoprene Belting • Solid Woven Belting—untreated, impregnated, coated—many widths and plies • Canvas Stitched Belting • Hycar Belting • Belting Specialties.

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Balata & Textile Belting Co.
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Factory: Easton, Pa.

penetrating. The former, on detonation, send captive bolts (no projectile leaves barrel) into the animal's brain. Non-penetrating bolts are concussion type units (mushroom-shaped bolt heads for striking animal's skull).

Units are energized by detonation of gunpowder charge or controlled compressed air. Included are safety features to prevent worker injury due to accidental discharge.

Here's a spotcheck of commercial instruments now in use:

Cash pistol: A pistol-shaped, manually discharged stunner[3] employing penetrating type of captive bolt propelled by exploding cartridge. Thousands of these are in use around the globe. Each costs $100, and operation (with quantity-purchased ammunition) runs as low as 2¼¢ per round. A large packer reports stunning 996 cattle per 1,000 rounds (remaining four rounds accidentally fired without stunner being applied to animal's head).

Light in weight (6 lb.), this well balanced stunner has muzzle knobs that momentarily engage animal's head for firm contact at detonation. Only plant change required is height adjustment of knocker's walk at stunning pen.

Major disadvantage is damage to animal's brain, which must be discarded or trimmed of blood spots. injury varies with bolt's penetration (controlled by operator through selection of ammunition of different strengths according to types of animals run).

Even the most skillful knockers will frequently miss their precise aim. Misses and near misses infuriate the animals, result in excessive adrenal-gland secretions, adversely affecting meat quality. Tests indicate that dark beef cuts are caused this way.

Remington stunner: A cartridge-operated device[4] with non-penetrating mushroom head. Cartridge (22-caliber) explodes as bolt head is placed in contact with animal's skull. Bolt head is driven forward about 4 in. Capacity is up to 70 head per hour.

Schermer stunner: A cylindrical, cartridge-type, penetrating-bolt device[5] developed in Germany and used there several decades. It's manually triggered. Respective models weigh 3½, 4, and 5 lb., cost $37.50 to $150. Cartridges run under 3¢ each. Built-in safety device prevents accidental firing.

Thor air gun: A modification of conventional air-hammer unit, it utilizes a ½-in. dia. penetrating and re-

CIRCLE 113 ON READER SERVICE CARD→

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FLO-SWEET BLENDS... a growing family of fine sweeteners

When only the right *combination* of characteristics will meet your requirements for a top quality sweetening agent . . . turn to Flo-Sweet. In the growing family of Flo-Sweet blends, you will find a rich variety of types and ratios from which to choose.

Doubly refined and united by a special comogenizing process for utmost uniformity, Flo-Sweet blends open up whole new fields for food manufacturers who are readying new table delicacies to tap tomorrow's rich and growing markets. To find out how these versatile sweetening agents can best fit into your own new food products development program, consult your Flo-Sweet Engineer. Or write for the brochure "New Ingredients for New and Improved Food Products." It tells all about four new Flo-Sweet liquid sugars!

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SUCRODEX (*cane sucrose and dextrose*)
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FIRST IN LIQUID SUGAR

Attention cereal makers:

Here's how Tora Food® can give you a new sales-building nutrition story at low cost

If you need a powerful new story to spark the sales of your cereal, Tora Food (Red Star's brand name for Torula Yeast U.S.P.) is your answer. And you can actually *save* money. Here's what we mean:

How will Tora Food improve nutritional content of cereal? Here are some specific nutritional factors housewives know and look for in cereal. This chart shows you how Red Star Tora Food increases these factors in a typical cereal—corn meal.

PER 100 GRAMS OF CORN MEAL

	Corn meal as is	Corn meal plus 3% Tora Food
Protein	9.00 grams	10.50 grams
Vitamin B_1	0.30 milligram	0.66 milligram
Vitamin B_2	0.08 milligram	0.20 milligram
Niacin	1.90 milligrams	2.80 milligrams

What totally will Tora Food add to cereal?
(At a level of 3# to 100#)

Vitamin B_1	163.5 milligrams worth
Vitamin B_2	54.5 milligrams worth
Niacin	408.6 milligrams worth
Vitamin B_6	40.8 milligrams worth
Para-amino benzoic Acid	20.4 milligrams worth
Pantothenic Acid	150.0 milligrams worth
Folic Acid	95.3 milligrams worth
Choline	4.8 grams worth
Inositol	5.4 grams worth
High quality Protein	1.5 lbs.

Here is a nutritional "barrage" that can't help but impress the nutrition-conscious housewife.

How can Tora Food actually save you money? The ingredients listed above would cost you 87.33¢ at current price levels, if you bought them individually. You get these *same* ingredients in the *same* amounts for only 54¢ in Red Star Tora Food. That's 33.33¢ saved. (Incidentally, the same amount of brewer's yeast would cost you between 72¢ and 84¢.)

In addition, Tora Food saves you money on handling and inventories. Instead of buying, storing, handling and keeping books on 10 or more different ingredients, you need handle only *one* when you use Red Star Tora Food.

How else will Tora Food improve saleability of cereal? Tora Food will intensify the flavor of your cereal. It has a mild, pleasant flavor with the ability to enhance the natural flavor of the product to which it is added.

Furthermore, Tora Food is an antioxidant and helps give your cereal longer shelf life.

Who besides cereal makers can use Tora Food? Almost any food processor. Here we've talked specifically about cereal makers, but baby food processors are already using Red Star Tora Food successfully. And here are some other types of processors who can use Tora Food to big advantage: spice, soup, chocolate, peanut butter, sauce and gravy, health food, smoked yeast and pharmaceuticals.

If you are a cereal maker (or *any* food processor) who wants a new sales-boosting nutrition story, write to us. We'll be happy to show and discuss with you work and analysis that has been done. Or if you prefer, we'll be happy to have a nutritionist call on you. Write to the address below.

Nutritional Division

RED STAR YEAST & PRODUCTS CO.

Milwaukee 1, Wisconsin

tracting bolt.[8] Compressed air (about 180-psi. pressure) is the propellant. Employing an air compressor (1-2 hp. powering two to four units) gun instantly refires (need not be reloaded each time). This automatic repeat action enables instant second hits if necessary. Strength of blow can be regulated to suit conditions. Hogs, sheep, or cattle are handled at 125 head per hour.

These units run $495 to $740. Only additional cost is for electricity to power the compressor. A test run on 100,000 cattle reportedly entailed a current bill of only $1.64 (81 kwhr. at 2½¢ per kwhr.).

Easy-to-handle, this unit weighs less than 8 lb. It has a lever that safeguards against accidental penetration and which must be depressed before tool can be activated. Further, its type of action makes it virtually recoilless—an additional safety factor.

Gunshot: This is the use of firearms to explode bullet through skull and into brain. Shooting is applicable to all animals. But for evident reasons it is not likely to come into common practice.

Shechitah: This is the Jewish ritual method of cutting animal's throat with sharp knife with quick motion.

References to Makers

1. The Allbright-Nell Co., 5323 S. Western Ave., Chicago 9. (361)
2. Reliable Packing Co., 1440 W. 74th St., Chicago. (362)
3. Koch Equipment Co., 2520 Holmes St., Kansas City 8, Mo. (363)
4. Remington Arms Co., Inc., Bridgeport 2, Conn. (364)
5. Alfa International Corp., 118 E 28th St., New York City 16. (365)
6. Thor Power Tool Co., 175 N. State St., Aurora, Ill. (366)

"I'd help you, Jim—but I missed the safety class that covers this particular thing."

IN CORROSION RESISTANT PROCESSING EQUIPMENT

Style A Kettle ⅓ Jacketed, 5 to 500 gal.

Style CW Kettle ⅓ Jacketed, 80 to 300 gal.

Style B Kettle Full Jacketed, 10 to 300 gal.

Style CW3T Kettle with Center-Line Scraper Agitator, 80 to 300 gal.

The Name for Quality is LEE

Style C Kettle ⅓ Jacketed, 5 to 100 gal.

Pressure Kettle ⅓ Jacketed, 40 to 200 gal.

Storage Tank 100 to 5,000 gal.

Pulp Tank 500 to 2,000 gal.

Vacuum Pan 10 to 500 gal.

Quick Cooling Pan 50 to 200 gal.

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The price of the packaged product doesn't faze Hoerner experts at all. They've found that very expensive things travel as safely as less costly items in properly designed corrugated boxes. If you manufacture a product with above average value, let a Hoerner Packaging Engineer show you how safely – and economically – corrugated containers can ship it. Call the nearest Hoerner office or plant.

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Low-Dose Irradiation Controls Citrus Rot

Gamma irradiation, applied at 150,000-300,000 rep, prolongs shelf life of citrus fruit without causing skin discoloration or softening.

Lemons and oranges were artificially inoculated with green and blue mold producing fungi, incubated 18-20 hr. at 75F., then rayed.

Lemons inoculated with *P. digitatum* and treated with 150,000-200,000 rep remained satisfactory for 12 days at 75F., 17 days at 55. Unirradiated controls began to rot in 3 days. Shelf life of lemons inoculated with *P. italicum* was extended to 15 days at 75F., 17 at 55 with 150,000 rep.

A dose of 200,000 was optimum for navel oranges inoculated with *P. italicum*. When held at 75F. no decay or irradiation injury appeared within 20 days (controls started to rot in 4 days). At 41F., treated oranges remained in good condition for 65 days, untreated ones less than 15.—Agr. *Marketing Reprint*, "Factors Influencing the Use of Gamma Radiation to Control Decay of Lemons and Oranges," March, 1959.

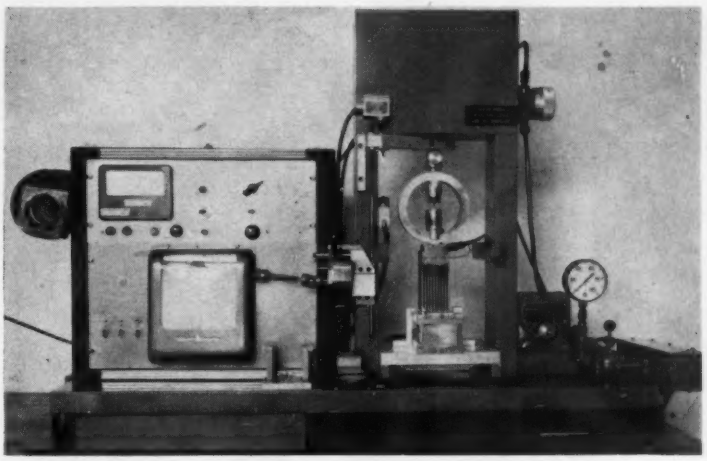
High Sugar Content Betters Frozen Sweet Potatoes

It is possible to prepare high quality frozen sweet potato slices from certain varieties of tubers grown commercially in N. Carolina.

This was demonstrated by studies of 11 varieties (either cured at 85F. for 7 days and stored at 55F., or uncured and stored at 55F.). Roots were peeled in boiling 10% lye for 7 min., trimmed and cut into ½-in. thick slices (both longitudinal and transverse), then cooked 10-12 min. in boiling syrup. Syrup concentrations employed were 30, 45 and 60% sucrose. Cooked slices were packed in aluminum trays and frozen in an air blast at 0F.

Best results were obtained when roots were sliced longitudinally, cooked in 45-60% syrup, and contained 20% sugar.

High quality products were prepared from NC 171, Georgia Red, Goldrush, Kandee and Allgold varieties; fairly good ones from Porto Rico and Carogold, and poor quality ones from Earlyport, Arcadian, Redgold and Nemagold.—*Food Tech.*, 448-50, Aug. 1959.



Tenderness of Fruits and Vegetables "Charted" by Modified Shear Press

Designed and built by AMS engineers and technologists at Beltsville, Md., the motor-driven unit (photo) measures texture of food products and records results on graph paper in a roll-type recorder. Previously used devices had hard-to-read needle gages.

The curves are good indications of tenderness and fibrousness, with each product giving its own particular pattern. Readings are valuable indications of good and bad effects that some handling procedures have on texture. They also afford a reliable basis for grading and quality control.

For example, texture of asparagus spears which previously had been difficult to test, now could be easily measured. Differences in tenderness of individual stalks could be shown as well as differences between tip, center, and butt sections of the same stalk.

Curves for strawberries showed definite differences in varieties. Those having tough skin and core tissue produced curves with relatively sharp peaks, those with uniform texture showed more even curves.

Whole kernel corn samples presented interesting resistance curves. Firmness of kernels registered as a low smooth curve that rose and broke sharply when pericarp or skins were sheared. Tests with pineapple slices clearly indicated fibrousness. Tough slices gave curves with high pressure peaks. More tender ones had much lower peaks. — *Agr. Marketing*, (USDA Agr. Marketing Service, Wasington, 25, D. C.), 10-11 September 1959.

Status of Irradiation as Food Preservative

Work on radiation of foods has been concerned largely with finding out which items are acceptable organoleptically following sterilization or pasteurization.

Off flavors following sterilization are virtually non-existant in oysters, shrimp, chicken and pork. Beef and dairy products, on the other hand, usually develop strong off-flavors. However, certain materials found in tomatoes will control off flavor in beef, and concurrent radiation and vacuum deodorization shows promise in the processing of dairy products.

At pasteurizing doses, most meats, sea foods, certain fruits and vegetables have acceptable flavors. But there may be changes induced that will affect product acceptability. This

Dairy Courses: Michigan State U.–Dairy Mfg. Conference, Nov. 4-5; Montana State College–Dairy Industry Week, Nov. 17-19; Penn State U.–Soft Ice Cream Short Course, Dec. 7-11.

PIONEER...

Early Americans, pushing Westward, typified the spirit of pioneering that has made this country the world's industrial leader.

Today, this capacity for active pioneering is nowhere better illustrated than in the development work carried on continuously by the makers of Mikro-Products. The Mikro Plan was created specifically to meet the production needs of the processing industries in the field of grinding, air conveying and dust collection.

See our Exhibit—27th Exposition of Chemical Industries, New York Coliseum, Booth #632

The Plan includes:

- Mikro Engineering to create equipment for new uses, and to improve existing methods.
- Mikro Laboratory Analysis for more effective methods of processing customers' materials.
- Mikro Service, a world-wide service, for on-the-spot solution of problems, including shipment of MIKRO replacement parts within 48 hours of order.

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is especially true in meats where chemical changes lead to appearance degradation in a short time.

In foods containing naturally occurring enzymes, doses several times as severe as those required for sterilization are needed to inactivate such enzymes. And failure to inactivate them leads to flavor and texture changes and, in certain instances, the growth of tyrosine crystals through hydrolysis of protein.—*Nutrition Reviews*, 257-59, Sept. 1959.

New Tomato Grading System

A new inspection procedure that is expected to increase accuracy and efficiency of grading tomatoes for processing has been developed by USDA's Agr. Marketing Service. It was demonstrated last month at several Eastern plants.

System departs from currently used practices in that color and condition of tomatoes are determined separately. Color of raw juice prepared from a representative sample of tomatoes from a grower's load is measured objectively with a newly developed raw juice colorimeter. Condition (or defects) evaluation is still subjective, but not confused with the more difficult one of color. —*USDA Agr. Marketing Service Release.*

Spray Guards Meat Color

Preventing fading of film-packed cured meats when exposed to light in display cases is the object of a recent patent.

This is accomplished by use of an aqueous suspension of ascorbic acid and catalase enzyme. Recommended procedure is to spray top surfaces of plurality of slices as arranged for packaging with an amount equal to 2 ml./lb. of meat. Product is then hermetically sealed in the film.—U. S. Patent 2,898,212, Aug. 4, 1959.

GC Detects Substitute Fats In Chocolate Products

Adulteration of chocolate products with non-cocoa butter fats can be detected and their quantities estimated by chromatography of fatty acids in the extracted fat. Procedure employs a column of diatomaceous earth prepared with dichlor-dimethyl silane, liquid paraffin, and acetone-water eluting solutions.

The fatty acids are isolated and

The big PLUS SERVICE EXPERIENCE RESEARCH PERFORMANCE in Oakite

Oakite DRYCID...acid in powder form... descales with safety and convenience

Oakite DRYCID, acid descalant in concentrated powder form, is far safer to use... much easier to handle than liquid acids. SAFER because potential danger of bottle breakage, liquid spillage and acid fumes is avoided. EASIER TO HANDLE because DRYCID comes in disposable containers. There are no heavy carboys to shift or store. No carboys to return. No costly book-keeping procedures.

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Working with Oakite is like adding a competent cleaning engineer to your staff. It brings the results of lasting research in cleaning and sanitation... an end to waste of time and materials... mechanization of tedious jobs... a wealth of experience... unsurpassed materials *guaranteed* to do the job.

Write for Bulletin B-6564. Better still send for your local Oakite man. Oakite Products, Inc., 27A Rector Street, New York 6, N. Y.

Export Division Cable Address: Oakite

OAKITE

50 1909-1959 SCIENCE years' leadership in industrial cleaning

Technical Service Representatives in Principal Cities of U. S. and Canada

CIRCLE 119 ON READER SERVICE CARD

CUT CAPPING COSTS WITH CAPEM

PFEIFFER FOOD PRODUCTS, INC. recently installed this new mayonnaise and salad dressing line in their Buffalo, N. Y. plant. They chose a CaPeM, Model C-4-F for the capping operation.

This capper applies 7200 caps per hour and handles jar sizes from 6 oz. to quarts. It incorporates a special Consolidated chuck-arresting device which prevents the chuck from dropping over the jar if no cap is present. No mayonnaise ever gets on the chuck.

There are more CaPeM Screw Cappers in use than any other make. Users select them because they combine low initial cost, low operating cost, and a minimum of maintenance.

CaPeM applies any standard cap or cover and many special types at speeds ranging from 2,000 to 10,000 per hour. It handles bottles, jars, cans or jugs of any size or shape. It delivers a perfect LEAKPROOF seal.

For recommendations on improving your own capping operation, write Sales Manager, Consolidated Packaging Machinery Corp., 1400 West Avenue, Buffalo 13, N.Y.

CAPEM → **THE MODERN SCREW CAPPER**

120 CIRCLE 120 ON READER SERVICE CARD

placed on the column in a solution of acetone and water. Then they are separated from the calcium by eluting with acetone-water solutions, ranging from 20-90% acetone.

The eluates are titrated with 0.05 N NaOH to determine amount of fatty acid present. Results can be expressed in a distribution curve with titration values plotted as ordinates and acetone strengths as abscissas.—*Int. Choc. Rev.* 14(5), 204-7; 14(6), 244-47, 1959.

Oil-Surfactant Emulsions Separate Rice Kernels

Cohesiveness between kernels of canned, pre-cooked rice can be greatly reduced by treatment prior to canning with an edible oil-in-water emulsion containing a small amount of surfactant.

Best results are obtained with treatments in each of the 3 processing steps. However, use of emulsion during final rinse is practically as effective, and is simpler and more economical.

Satisfactory emulsions were prepared with 5% cottonseed oil and 0.5% sorbitan monooleate, polyoxyethylene sorbitan monostearate, or carboxy methylcellulose. Suspensions of oil in water were ineffective, as were most surfactants alone. However, sorbitan monooleate was nearly as effective as the above mixtures.—*Food Tech.*, 473-74, Aug. 1959.

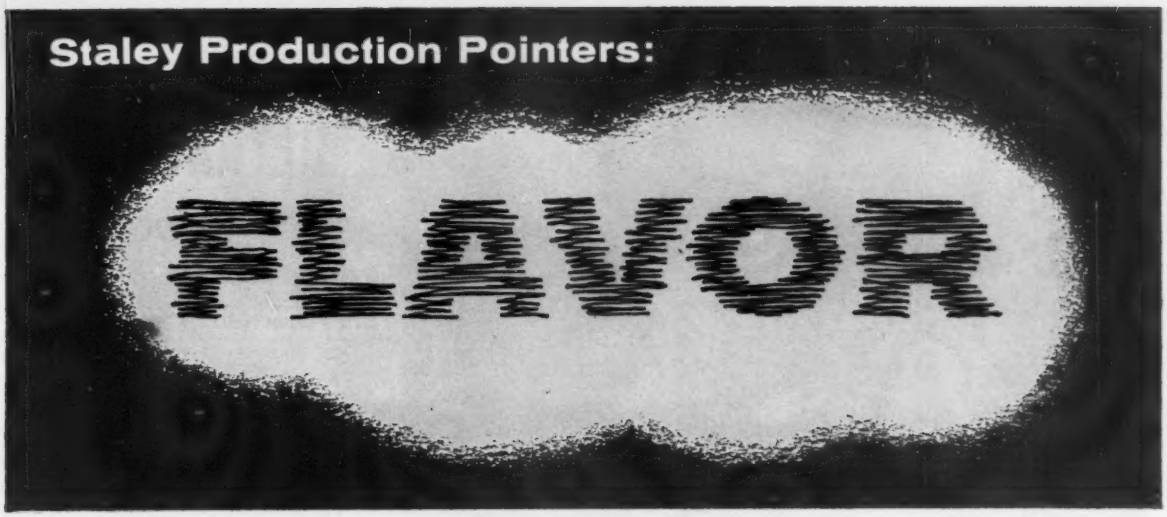
$NaNO_2$ is Unpredictable As Corrosion Inhibitor

Chromates are the most satisfactory corrosion inhibitor for cooling water used in air conditioners and evaporative condensers, or circulated over cooling towers.

However, they are sometimes considered objectionable in waters discharged to sewage systems or streams, and because they color the water. $NaNO_2$ could overcome these objections, but its behavior is somewhat unpredictable, and seems to depend on relative amounts of chlorides and sulfates in the water.

Sulfates influence its anti-corrosive properties adversely. Also, nonferrous metals are less effectively protected by $NaNO_2$ than are iron or steel. Supplements of borax, sodium benzoate, and other inhibitors have been suggested, but these unduly increase cost of treatment.—*Ind. & Eng. Ch.*, 51(4), 581-84, 1959.

Staley Production Pointers:



Sweetose Syrup Never "Clouds" a Flavor... Instead

Sweetose Enhances... Lets Your Original Flavor Shine Through

No matter what you process—pork and beans, catsup, jams and jellies, fruits, or sweet pickles—consider this important fact:

Ordinary sweeteners are hard to control—often produce excessive sweetness that overpowers true natural flavors. How, then, can these flavor-detracting variables be eliminated? It's easy, it's economical, when you use Sweetose, the original enzyme-converted corn syrup.

Bland, crystal-clear Sweetose never "clouds" a flavor. In fact, natural flavors are actually enhanced. But versatile Sweetose does more, much more, than improve flavor.

IN PORK AND BEANS—Sweetose assures precise control of browning and sweetness—with tangier, more appetizing flavor . . . improved color and sheen.

IN TOMATO CATSUP—Sweetose improves gloss and sheen. Protects against darkening. Holds rich, red color. Delivers a zestier flavor without masking even the most delicate spices.

IN SWEET PICKLES—Sweetose produces a firmer, crispier body, mellower flavor, brighter sheen—with faster finishing, less softening.

IN FRUITS—Sweetose captures and holds the true, fresh-picked color and flavor. Gives a firmer body—more appetizing appearance.

IN JAMS AND JELLIES—Sweetose makes natural fruit flavors come alive. Improves texture and tenderness. Enhances color and sheen with eye-appealing brightness.

These are but a few of the many Sweetose advantages. For the complete dollar-saving, quality-building story, see your Staley Representative or write today to:

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CIRCLE 121 ON READER SERVICE CARD 121

Versatile Carrier Conveyors Replace Men and Machines!

Versatile Carrier Natural-Frequency Conveyors are "doubling" efficiently as processing units in many food plants, *replacing costly labor and process steps.*

The conveying and processing of foods, from "sugar to cereals," are Carrier specialties. One, and often more, high cost process units can be eliminated in most food plants by merely installing *one dual-purpose Carrier vibrating conveyor.*

Some of the jobs where these low-cost, multi-purpose conveyors are meeting rigid process requirements include: washing, dewatering, sizing, picking tables, screening, coating, cooling, freezing, leaf and skin removal, flattening bags and distributing to multiple outlets.

All Carrier vibrating equipment features sanitary construction plus the exclusive, patented Natural-Frequency drive to assure gentle conveying and to prevent product bruising and degradation.

For further information write: Carrier Conveyor Corporation, 214 North Jackson Street, Louisville 2, Kentucky.

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VIBRATING EQUIPMENT
Engineering Specialists in Vibrating Equipment

CONVEY ● FEED
DEWATER ● SCREEN
COOL ● AGGLOMERATE
DRY ● SCALP ● COAT
DISTRIBUTE ● ELEVATE
● FLATTEN BAGS

122 CIRCLE 122 ON READER SERVICE CARD

Sonic puts ULTRASONICS to work

..in Peanut Butter increased shelf life by 150-200% ... less stabilizer ... creamier, better-flavored peanut butter ... increased sales ... that's what happened when Nabob Foods, Vancouver, put their peanut butter through Rapisonic. Cavitation "exploded" the droplets of stabilizer and finely ground peanuts to make one of the smoothest peanut butters you ever tasted.

..in Salad Dressings the best formula ... the most excellent ingredients ... blended by the best chefs, still won't keep salad dressing from separating out. A food company, famous for its dressings, tried passing them through the Sanisonic, the homogenizer which meets sanitary requirements. They licked their separation problem and ordered a second machine within six weeks.

Sonic Homogenizers develop and use all the energy right in the liquids with only 1/6 to 1/10 the power, and at a fraction of the first cost, of conventional equipment ... maintenance-negligible.

The Sanisonic
... meets sanitary requirements

Other Models
RAPISONIC ... production homogenizer
MINISONIC ... for small batches
AUTOSONIC ... continuous supply
DISPERSONIC ... abrasive emulsions

Sonic homogenizers can give you a superior emulsion, too. Send for technical bulletin

Sonic

SONIC ENGINEERING CORPORATION
146 Selleck Street, Stamford, Conn.

CIRCLE 226 ON READER SERVICE CARD

33-1/3% more capacity . . . 24" and 30" heights

in this new rectangular, mobile under-counter type

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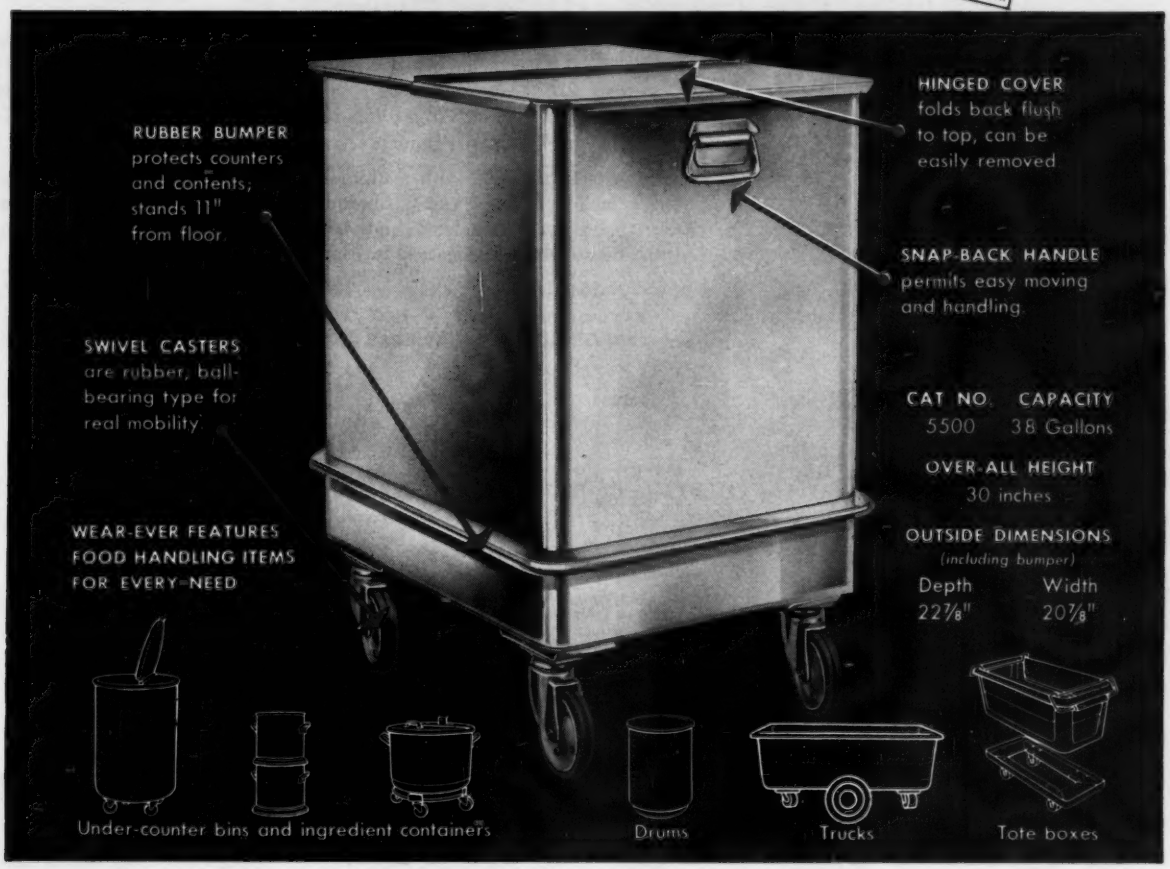
WEAR-EVER ALUMINUM TRADE MARK REG. U.S. PAT. OFF.



We've "squared away" the conventional round container, to give you ⅓ *more* carrying and storing capacity, *in comparable over-all size.* Think what this can mean to you in faster handling, fewer refills, greater utility.

Quality's the same, of course, as in all Wear-Ever Aluminum food handling items. Extra hard-wrought dent and scratch resistant alloy. Seamless construction. Smoothly rounded, easy-to-clean inside corners. Sanitary flared rim.

Naturally, we've designed this new container for a perfect fit under your standard cook's and baker's work tables —same as the round type.

Like to see a sample? Pick up the phone and ask your Wear-Ever man to wheel one over. Or send coupon for full details on our complete food handling line.

Ask us about our special equipment to your specifications.

WEAR·EVER ALUMINUM UTENSILS

WEAR-EVER ALUMINUM, INC.
WEAR-EVER BLDG., NEW KENSINGTON, PENNSYLVANIA

Wear-Ever Aluminum, Inc.
305 Wear-Ever Bldg., New Kensington, Pa.

GENTLEMEN: *I'd like to know more about your new rectangular under-counter bin.*

☐ Send me your catalog. ☐ Have your representative see me.

NAME .....

TITLE .....

Fill in, clip to your letterhead and mail today.

NEW ITEM! *Wear-Ever's new Metal Scouring Cloth. Won't scratch, won't mar, far outlasts ordinary scouring cloths. At your dealer's.*

RYKON *Grease*

passed this test at Corn Products Company

Situation: The springs in the grease chargers on expeller machines at Corn Products Company's Argo, Illinois, plant are under extra heavy tension. Due to this tension, oil formerly separated from the grease thickener in the grease cups. Bearings did not receive proper lubrication and the cups filled with grease thickener residue. The system needed cleaning every three months. Each time, large amounts of residue were found. Ten special-purpose greases were tried in an effort to solve the problem.

What was done: A Standard Oil lubrication specialist working with Corn Products' plant maintenance people recommended RYKON Grease #2 E.P. The system now needs cleaning only every six to nine months. Very little residue is found. Now RYKON Grease has become one of the important lubricating greases in use at Corn Products' Argo plant.

RYKON Grease is formulated with a unique non-soap organic thickener. The fibers of this thickener hold RYKON's fine quality base oil firmly in suspension. The grease resists water washing, high temperature and dirt contamination while providing superior lubrication to bearings of all types.

What you can do: Get more facts about RYKON Grease from the Standard Oil office nearest you anywhere in the 15 Midwest and Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago 80, Ill.**

You expect more from **STANDARD** *and you get it!*

Standard's Arnold Parus and chief lubrication foreman Henry Anderson take a look at expeller unit's grease system. Arnold Parus is well equipped through experience and training to work with plant men on lubrication problems. Arnold has a B.S. degree from Bradley University and three years' field experience in this kind of work. He has also completed Standard's Sales Engineering School.

Quick facts about **RYKON** *Grease*

- Heat stable. At sustained high temperatures, RYKON Grease remains soft and grease-like.
- Resistant to water washing.
- Mechanically stable. Minimum change in consistency in service.
- Resistant to oxidation. Thickener acts as inhibitor.
- Exceptional rust preventive properties.

MEN & COMPANIES

'Go American' . . . Manufacturers must take action to meet the needs of Europeans who are asking for more and more American food products and equipment.

So says Robert F. Miller, newly appointed Associate on Food Industries Projects for Porter International Co., Washington, D. C., representative for American manufacturers in 30 foreign countries.

Formerly in charge of American food exhibits in Europe for USDA, Mr. Miller sees big opportunities abroad, both in food distribution and manufacture.

As manager of the recent American Pavilion food exhibit at Lausanne, Switzerland, he reported "hundreds of inquiries asking 'When and where can I buy these products.'" He calls for manufacturers to answer these questions for their own interests.

Robert F. Miller

Originator and developer of the supermarket exhibit, Mr. Miller will handle exports and imports of food and food equipment. He will also study market potentials in Europe, seeking out opportunities for establishing or purchasing plants abroad.

R. Burt Gookin

Controllers' Chairman . . . Recently elected as H. J. Heinz Co. finance v.-p., R. Burt Gookin will now serve as general chairman of the annual National Conference of Controllers Institute of America at Pittsburgh.

At Heinz, he succeeded Frank B. Cliffe, who retired as v.-p. and chief financial officer but continues as a director.

Paul D. Hausenbauer, National Dairy Products Corp., will chairman the Institute's finance committee for the Pittsburgh event.

Russell N. Monbleau, General Foods Corp., will lead the foods, beverages, and allied products roundtable, assisted by Vice-Chairman Stanley E. Brackett, assistant controller, Walter Baker Div.

The 5,000-member Institute is a management organization of controllers and finance officers.

Dr. H. C. (Dutch) Diehl has been awarded an honorary life membership in the Refrigeration Foundation, of which he served as sole director since its organization in '44. One other such membership is held by **Prof. Rudolf Plank,** Karlsruhe, Germany.

Ralph O. Dulany, president of John H. Dulany & Son, has received the Salisbury Civic Award.

John D. Faulkner, chief of Milk & Food Program, U. S. Public Health Service, has received Citation Award of International Assn. of Milk & Food Sanitarians.

F. J. Hailer, Jr., has been named to succeed **Warren G. Kell** as representative of Ungerer & Co. in New England area.

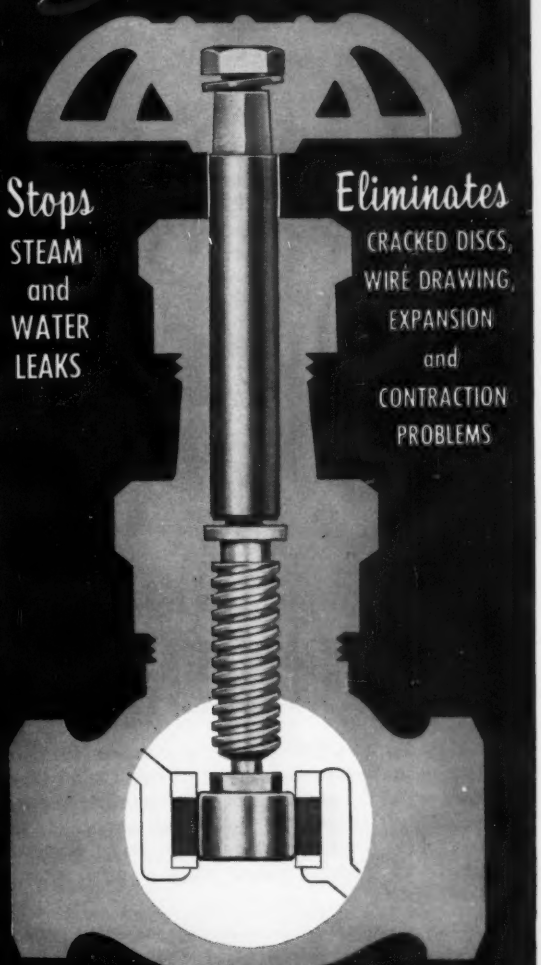
Robert O. Jenkins, v.-p. of Pet Milk Co., and executive v.-p. of subsidiary Pet Dairy Products Co., has been elected to board.

As new executive v.-p., **Rich-**

Dairymen!

Here is a Valve Designed Exclusively for YOU!

by Strahman



A resilient sealing ring and stainless steel piston replace the metal seat or disc found in the conventional valve, the cause of most valve troubles. The Strahman Valve seals itself as a cork seals a bottle. In throttling, the erosive action of the elements passing through the valve cannot have any effect on the sealing surfaces.

Strahman Steam and Water Valves are made of Bronze construction, with Stainless Steel Stem and Piston, assuring long life.

Write direct for complete catalogue

STRAHMAN VALVES, Inc.

NICOLET AVE., FLORHAM PARK, N. J.

Speed processing the natural way

with

TAKAMINE ENZYMES

There is hardly a food product that cannot be improved by enzymes, or a process that can't be aided by these desirable catalytic agents. Takamine enzymes have been especially effective in the production of chocolate syrups, wines, ciders, beer, meat tenderizers, cereal products and animal feeds. These willing workers offer these basic advantages:

• Are of natural origin. • Highly specific in their actions. • Work best at mild temperature and near-neutral pH. • Act rapidly at relatively low concentrations. • Readily inactivated when action is complete.

Takamine research is constantly developing new materials and methods for the food processing industry. We may be able to help solve your particular processing problem. Please write us for complete information.

It will TASTE better, LOOK better, SELL better with Takamine Enzymes!

TAKAMINE® Miles Chemical Company

("pronounce it Tack-a-ME-nee)

division of Miles Laboratories, Inc.
Clifton, New Jersey
phone PRescott 9-4776 or TWX PAS-78

9TAK-20

ard E. Krafve joins **Pres. Charles F. Adams** and **Sr. v.-p. Percy L. Spencer** to make up three-man "Office of President" of Raytheon Co.

James A. Moffett has been moved up to post of senior v.-p. of Corn Products Co. He also continues as president of Corn Products International Div.

Charles G. Trundle is new market research manager of Dole Hawaiian Pineapple Co., San Jose, Calif. He was formerly with Mennen Co. in same capacity.

A. C. Webb, Jr., is new president of Orange Smile Sirup Co., St. Louis, and Cheer Up Sales Co., subsidiary operating in same city.

Dr. B. E. Proctor Dies

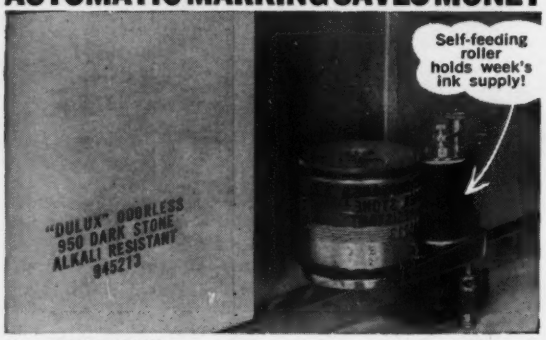
Outstanding food technologist, Dr. Bernard E. Proctor, 58, died last month. He headed MIT's Dept. of Food Technology.

Dr. Proctor was nationally known for work in preservation and processing, microbiology, irradiation in food sterilization, and dehydration.

During WW II, he served as chief food consultant and director of subsistence and packing research and development.

His memberships included IFT (president), Soc. of Refrig. Eng., Nat. Assn. of Refrig. Warehousemen, Frasch Foundation Awards Committee (chairman), Public Health Assn., Nat. Research Council on Aerobiology, and Prescott Food Labs. (director).

AUTOMATIC MARKING SAVES MONEY



New ROLACODER conveyor and case-sealer attachment marks boxes, cartons, drums, filled bags automatically

Saves on container printing costs... eliminates hand-stamping... insures faster identification

- Low-cost . . . pays for itself in months
- Compact . . . works by friction . . . requires no troublesome adjustments
- Install it yourself on any conveyor, case-sealer, etc. to mark from side or top
- Not a gadget — beautifully designed and precision-made to give consistently dependable performance, uniform impressions
- Patented type base holds type and dies securely, makes copy changing easy
- Spots imprints accurately in any desired location
- Many thousands in use by all industries

Models to suit every need . . . including twin-action units for marking 2 or 4 sides of cases simultaneously.

Write today for Bulletin "ROL-3"

First and foremost in automatic production-line CODING, MARKING and IMPRINTING machines

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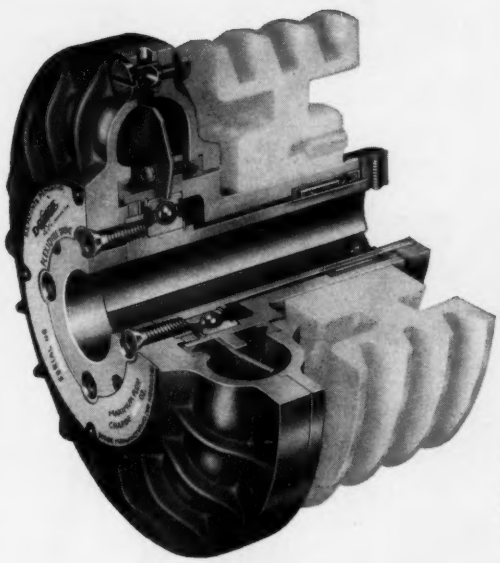
In Canada: Richardson Agencies, Ltd. • Toronto & Montreal

Booth 712 • PMMI SHOW • New York • Nov. 17-20

WHAT'S YOUR PROBLEM?...

- ☑ Overheated motors?
- ☑ Excessive belt maintenance?
- ☑ Breakage of materials being processed —like thread, wire, paper?
- ☑ Expense of oversize or high torque motors?
- ☑ High demand rate?
- ☑ Expense of reduced voltage starters?
- ☑ Clutch trouble?
- ☑ Breakage of transmission parts due to instantaneous shock loads?
- ☑ Damage and recurring down-time from overloads?



FLEXIDYNE

THE DRY FLUID DRIVE

It is no longer necessary to accept the destructiveness—the costliness—of conventional starting in the mechanical transmission of power. Flexidyne changes that!

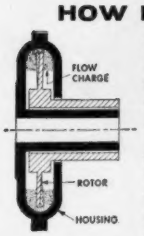
Flexidyne is the new way to start loads *smoothly*—to protect against shock and overload—to save power—all *without any sacrifice of efficiency at full load!*

This revolutionary development is ushering in "the day of the soft start"—which can mean thousands of dollars to you in equipment savings and in better, more economical operation.

Flexidyne is available, off the shelf, in Drives and Couplings. Capacities range from fractional to 1,000 hp. Ask your local Dodge Distributor or write us for technical bulletin.

DODGE MANUFACTURING CORPORATION, 2800 Union St., Mishawaka, Ind.

HOW FLEXIDYNE WORKS



The "dry fluid" in Flexidyne is tiny heat-treated steel shot. A measured amount, called the "flow charge," is contained in the housing, which is keyed to the motor shaft. Inside the housing is a rotor, free to revolve relative to the housing, but connected to the load.

When the motor is started, centrifugal force throws the flow charge to the perimeter of the housing, packing it between the housing and the rotor, which transmits power to the load. Initial slippage is momentary. Housing and rotor become locked together and achieve full load speed without slip and at 100% efficiency.

CALL THE TRANSMISSIONEER — your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look in the *white* pages of your telephone directory for "Dodge Transmissioneer."

DODGE

of Mishawaka, Ind.

CIRCLE 127 ON READER SERVICE CARD 127

GAYLORD PLAYS PROGRESSIVE WHEN IT COMES TO PACKAGING

Whether you want a new variation on an old favorite, or a "way-out" box, Gaylord has the experience and vision to compose containers that waltz through your packaging operation.

Be sharp . . . stay in the key of G. Ask your G-Man to sit in on your next packaging session, and watch him harmonize.

GAYLORD CONTAINER CORPORATION

Gaylord Boxes

HEADQUARTERS, ST. LOUIS
PLANTS COAST TO COAST

DIVISION OF **Crown Zellerbach Corporation**

Industry

Minute Maid Corp. has acquired **Tenco, Inc.,** major producer of soluble coffee, according to MM President John Fox. Calling move a "marriage of America's two favorite breakfast beverages—orange juice and coffee," he said no change is expected in marketing of Tenco products, which are running $35 million in annual domestic sales.

Libby McNeill & Libby Co. plans to spend $15 million in expansion and improvements in '60, more than double amount spent this year. President Bridges reports that sales for fiscal year ending last June totaled over $296 million.

Dossin Food Products has become **Pepsi-Cola Bottling Co. of Detroit,** as subsidiary of soft drink firm. James G. Knight, former Pepsi Philadelphia chief, has been elected its president and managing director, succeeding Roy L. Dossin, who will be board chairman.

Standard Brands, Inc., will establish Puerto Rico's first bakers' yeast plant near San Juan.

Members of **National Assn. of Refrigerated Warehouses** have set all-time safety record, reducing accident frequency and severity 40% and 80%, respectively, over past 7 yr.

Associated Industries

Firmenich, Inc., flavoring producer, has purchased the **Ciba Co.** plant at Kimberton, Pa.

Henry H. Ottens Mfg. Co., flavor producers, is celebrating its 75th anniversary.

Celanese Corp. has completed a multi-million dollar expansion of its acetic acid plant at Pampa, Tex.

The J. W. Greer Co. has acquired **Vacuum Candy Machinery Co.** and its subsidiary, the **Racine Confectionery Machinery Co.** of New York.

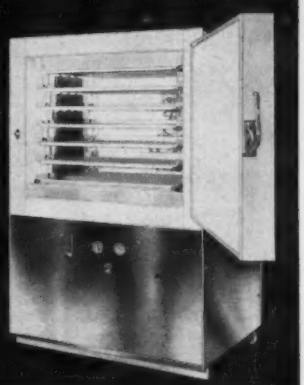
Correction

Through makeup error, the two photos on p. 103 of September FE were transposed. Initial photo shows Mr. Potter, Longstreth Medal recipient; second photo is of Mr. Rawlings, General Mills v.-p.

NEW! COMPACT, SELF-CONTAINED DOUBLE CONTACT FOOD FREEZER!

DOLE
Freze-Cel
MODEL 2735-6

THE ANSWER FOR THE SMALLER OPERATION



6-Station unit: 240—5" x 4¼" packages per freeze . . . all refrigeration and hydraulic equipment self-contained . . . uses R22 refrigerant . . . only 17 sq. ft. of floor space required . . . patented DOLE "Thermo-Film" feature increases freezing speed up to 10% . . . installation requires only electrical, water and drain connections.

DOLE REFRIGERATING COMPANY
5950 NORTH PULASKI ROAD, CHICAGO 46, ILL.
103 PARK AVENUE, NEW YORK 17, N. Y.
Canada: Dole Refrigerating Products Limited, Oakville, Ont.
CIRCLE 228 ON READER SERVICE CARD

RUSCO
since 1834

ENGINEERED BELTING
. . . OUR 125th YEAR
THE RUSSELL MFG. COMPANY
MIDDLETOWN, CONN., U.S.A.

Introduces

A NEW IMPROVED WHITE COTTON BELT
employing the familiar centerbound principle

and RUSCO gold stripe BISCUIT BELTING
for the finest in a smooth, finely woven, low elongation belt... all new for the bakery trade

YOUR INQUIRIES ARE INVITED

←CIRCLE 128 ON READER SERVICE CARD

CIRCLE 129 ON READER SERVICE CARD

His name is Clark...

he's with Calpak

Bill Clark is Director of Engineering for the California Packing Corporation, owners of one of the most distinguished labels in the food business . . . *Del Monte.*

His job is the planning of facility requirements for a business at the $350 million annual sales level, plus the management of a centralized design service for buildings and equipment currently valued at more than $70 million.

He thinks in terms of engineering – and in terms of real estate, insurance, legal requirements, too. His specific responsibility lies in design, efficiency, safety, economy. But in a broader sense he takes into consideration the whole management spectrum of production, packaging and marketing.

For William L. Clark is one of this industry's "whole men" . . . a profit-minded food management man. And so, inevitably, you'd expect him to be a regular reader of FOOD Engineering, *the complete magazine for the whole man.*

Here, your advertising is being read by "whole men" at every management level...

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Gen. Manager
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Marketing V.P.
Pepsi-Cola

M. Asproyerakas
V.P.-Chief Engr.
National Baking

Jeno Paulucci
President
Chun King

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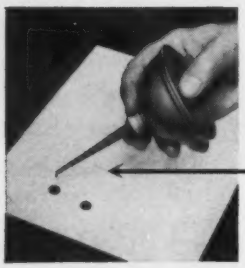
FOOD
ENGINEERING

For Better Management in Manufacturing, Packaging, Marketing

A McGraw-Hill Publication • **330 West 42d St., New York 36, N. Y.**

HAVING PACKAGE TROUBLE BECAUSE OF FATS GREASE OILS ?



GREASE-PROOF PATAPAR STOPS PENETRATION

NO GREASE "CRAWL"

THE TEST: Drops of oil placed on this Patapar remain on the surface indefinitely. The oil will not spread or "crawl." No seep through.

As a packaging material, or wherever a grease-proof barrier is required, new types of Patapar Vegetable Parchment provide positive resistance. With these grease-proof Patapars there is no penetration. Oil will not spread on Patapar's surface. There is no grease crawl—no "wetting".

Patapar is used alone for packaging, or laminated to other materials for end uses such as fiber drums, spiral tubes, cartons.

Patapar gives you WET-STRENGTH, too

High wet-strength is a basic quality of the many different types of Patapar. And, made from pure cellulose, Patapar is odorless, non-toxic. *It is furnished plain or colorfully printed.*

If you would like to test Patapar, write us telling your requirements. We'll send technical information and samples of the type we recommend for your purpose.

Patapar® VEGETABLE PARCHMENT

HI-WET-STRENGTH · GREASE-RESISTING

PATERSON PARCHMENT PAPER COMPANY, *Bristol, Pennsylvania*

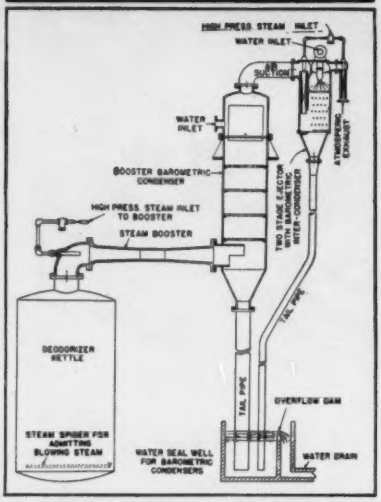
West Coast Plant: Sunnyvale, California · Sales Offices: New York, Chicago

SPECIAL PAPERS FOR SPECIAL PURPOSES

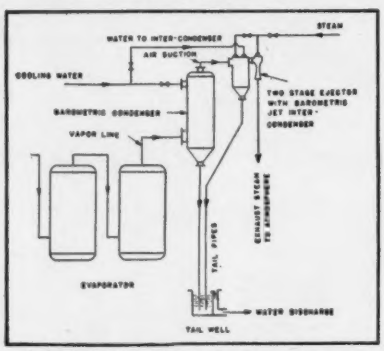
132 CIRCLE 132 ON READER SERVICE CARD

Here's how to get high vacuum at lower cost... from

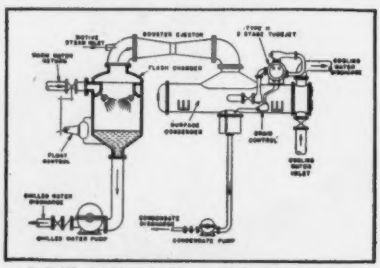
C. H. WHEELER



In Deodorizing Operations—C.H. Wheeler Tubejet® Booster with Barometric Condenser, and 2-stage Tubejet with Wheeler Barometric Inter-Condenser, produce high deodorizer vacuum. No moving parts means less Tubejet maintenance.



In Evaporation, Tubejet Ejector works with Wheeler Barometric Condenser to produce high vacuum. Initial cost of Ejector is low installation easy because of lightness, simple connections.



C. H. Wheeler Steam Jet Vacuum Refrigeration is used extensively in producing cold process water for food and chemical plants. Where there is an abundance of steam at low pressure and cooling water for the condensers, this is an ideal way to produce chilled water at low cost, with trouble-free equipment.

FREE! 35-page Catalog 1462.

Process Equipment Division

C. H. WHEELER MFG. CO.

19th and Lehigh Avenue, Philadelphia 32, Pa.

CIRCLE 229 ON READER SERVICE CARD

FE SERVICE CENTER

Catalogs ..... p. 155
Books ..... p. 161
Patents ..... p. 165
Classified ..... p. 167
Advertisers' Index ..... p. 170
Reader Service ..... Back of Book

NEW EQUIPMENT & SUPPLIES

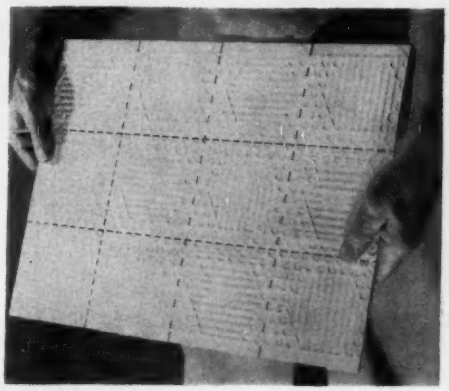
New Vacuum-Cleaner Line

Three series comprise new line of Imperial industrial vacuum cleaners: The "5" (¼-hp.), "10" (1-hp.), and "15" (1½ hp.).

Each of these is available with 7, 12, and 17-gal. tanks, and is adapted for pickup of both wet and dry materials.

Among features is special washable, synthetic-fiber filter that provides more than 1,400-sq.-in. of filter area.—*Multi-Clean Products, Inc., St. Paul 16, Minn.*

Circle 367 on Reader Service Card



Multi-mounted for snug bond . . .

. . . twelve go on at a time

Sheeted Tiles Cut Time and Cost of Installation

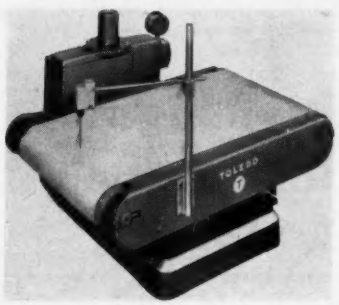
Faster, simpler, more economical tiling installations are reported with use of this new type multi-mounted, glazed ceramic.

Called Master-Set, tiles are arranged in series of twelve (4½-in. size) on special paper-thin sheet. Thus they're applied a dozen at a time, going from carton to wall in a single motion (no soaking necessary). Sheets may be set either vertically or horizontally without affecting joint alignment. And rows or individual tiles are readily cut for special fitting. Also offered are larger tiles which run nine to a sheet.

Tiles may be placed on any plumb and true surface, prepared by any of the accepted methods for installing ceramic tile—with inorganic adhesives, thin-set dry curing mortars, or conventional mortar with a self-curing bond coat.

There are choices of regular and crystalline glazes, along with some of the maker's special scored-tile designs.—*American Olean Tile Co., Inc., Lansdale, Pa.*

Circle 369 on Reader Service Card



Continuous Checkweigher

Larger institutional containers (50-200 lb.) are speedily checkweighed by this new high-capacity unit. Rate: Up to 40 items a min.

Designated Model 9460, machine has belt-type conveyor on weigh section, providing continuous action without stopping item on scale. Change from one package weight to another is readily made by re-setting poises on enclosed beam.

Also available is visual indicator to show weight-zone of items (Under, OK-Light, OK, OK-Heavy, Over). And reject mechanisms may be operated with unit.—*Toledo Scale Corp., Toledo, Ohio.*

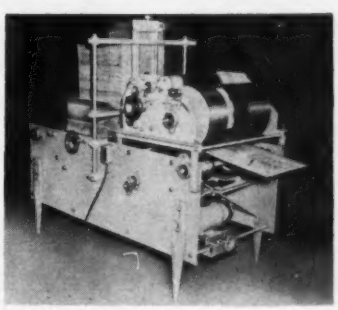
Circle 368 on Reader Service Card

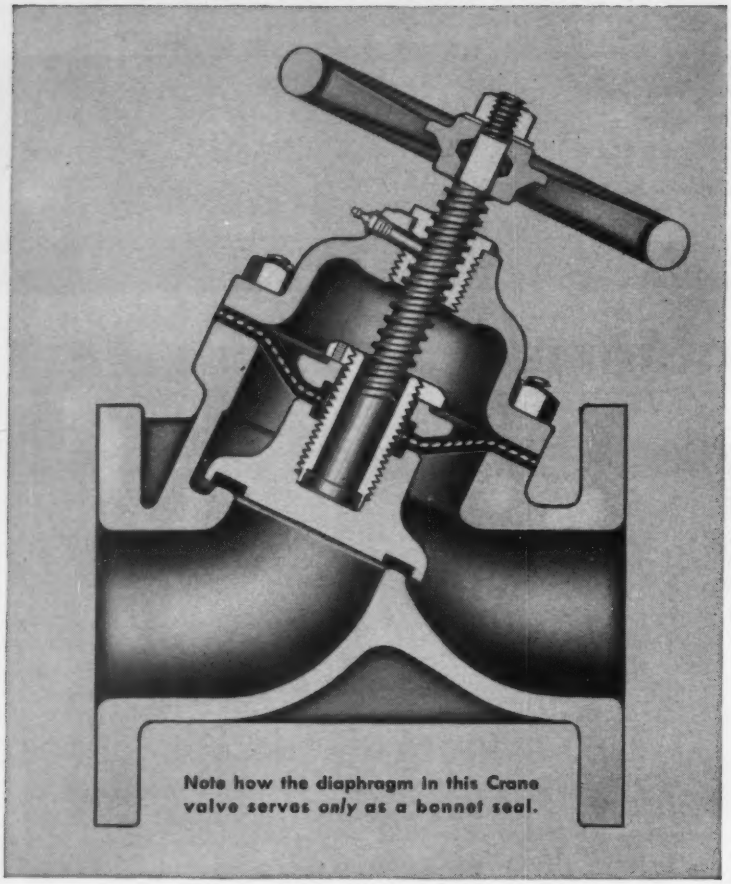
Speeds Case Printing

Newly available is this power-driven case printer, the Model 4296. It handles flat cartons in the size range 6x10 in. to 32x44 in. at variable speeds from 25 to 50 a min.

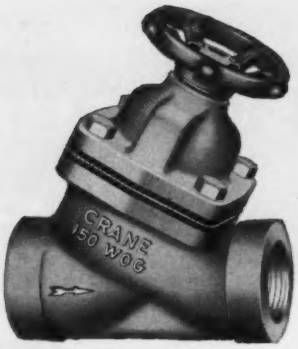
Unit includes automatic counter and mechanical centering of cartons. Type changes are termed rapid.—*Kiwi Coders Corp., 4027 N. Kedzie Ave., Chicago 18.*

Circle 370 on Reader Service Card

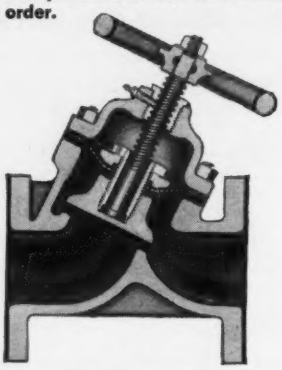




Note how the diaphragm in this Crane valve serves *only* as a bonnet seal.



Crane screwed-end diaphragm valve: ½" to 2". Flanged ends: ½" to 14". Four body materials; five trims. Special body and trim materials available on order.



Lined valves—flanged ends only. Neoprene and hard, natural rubber linings regularly available. Other linings on special order.

Crane separates disc and diaphragm to make diaphragm valves last longer

NOW IN SIZES UP TO 14 IN.

The diaphragm in ordinary valves is stretched to serve as a disc as well as a bonnet seal. This makes it vulnerable to crushing, cutting and abrasion. Result: accelerated wear . . . threat of rupture . . . frequent diaphragm replacement.

Not so with Crane diaphragm valves. The diaphragm has only *one* function: sealing the bonnet against line fluids. Result: diaphragm lasts longer—there's less valve maintenance cost. The disc is a *separate unit* and shuts off flow even if the diaphragm should fail.

Typical added Crane features

Y-pattern body offers least resistance to flow, minimizes pressure drop . . . *flat-faced disc* with durable, resilient insert ring resists erosion; seats tightly . . . valve operation requires lower torque; fewer turns.

Handle all types of fluids

Crane diaphragm valves are available for a wide variety of services—from water, air and gas to corrosive, volatile and hard-to-hold liquids. They are supplied regularly with bronze, cast iron, aluminum or stainless steel body—with neoprene, buna N, natural rubber, Kel-F or Teflon trim. Neoprene or hard, natural rubber lined valves also supplied. Other body materials, trims and linings on special order.

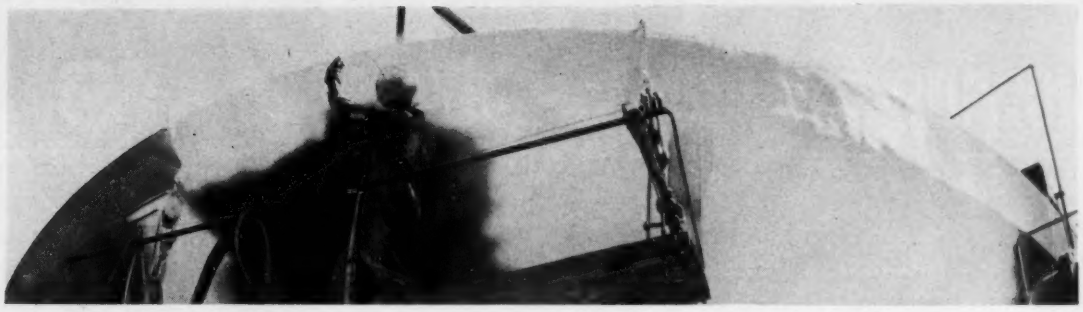
Ask for new Bulletin AD-1942

For complete details, consult your Crane Representative or write to address below for bulletin.

CRANE® VALVES & FITTINGS

PIPE • PLUMBING • HEATING • AIR CONDITIONING

Since 1855—Crane Co., General Offices: Chicago 5, Illinois—Branches and Wholesalers Serving All Areas



Spray-Applied 'Rigid Foam' Proofs Structures

A striking advance is reported in spray-on insulating, corrosion-proofing and weather-proofing of tanks, cold rooms, corrugated structures (as Quonsets), large pipes, and the like.

The technique is stated to double efficiency while saving on equipment cost and installation time.

Employed are specially formulated urethane and polyether-based foams. They're applied by portable spraying equipment (De Vilbiss) at rates from 10 to 20 boardfeet a minute.

Sprayed components reach surface as a liquid and begin almost instant expansion. Foam rises and sets tack-free (dry to touch) in less than 5 min. And thick applications go on vertical surfaces without sagging or dripping.

Maker says that plant maintenance men can easily spray the foam—a relatively untrained crew recently laying a 1½-2-in. thick coating over 1,500 sq.ft. of a large brine storage tank in 30 hr.—*Wyandotte Chemicals Corp., Wyandotte, Mich.*

Circle 371 on Reader Service Card

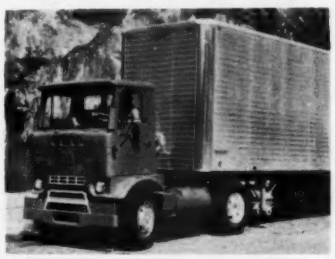
Special Poly for Bag Savings

A new heavy duty film bag, designated "Type B," features a 40% lower material gage. This has been achieved through development of a new super-tough polyethylene.

The bag is termed specially suitable for shipping and storing powdered milk and other food products, particularly for moisture protection.

Economy of the film-gage reduction is seen bringing the poly bags competitive with the multi-wall paper bags.—*Chippewa Plastics Co., Chippewa Falls, Wis.*

Circle 372 on Reader Service Card



Extra-Load V-6 Tractor

Just put into production is this new lightweight highway tractor, the Model DFR-8000. It features aluminum tilt-cab with 48-in. bumper-to-back-of-cab dimension, independent front wheel suspension, and V-6 diesel engine.

Weight-saving design permits operator to load an extra ton of cargo and still be within the 61,000-lb. G.C.W. weight rating.

Specially hailed is the new V-6 powerplant, which weighs 200 lb. less than conventional in-line units of the same displacement. Further, tractor's new fabricated frame is 300 lb. lighter. A sleeper cab is available as an option.—*GMC Truck & Coach Div., 660 South Boulevard, East, Pontiac 11, Mich.*

Circle 373 on Reader Service Card

Handler Eliminates Pallets

Model FFE-20 handler wins economy of palletless loads through use of side-shifter and load-holding attachment.

This unit eliminates the need to ship loads on pallets and return empty pallets to warehouse.

Use by both manufacturers and warehousemen is recommended. Photo shows unit handling strapped beer load.

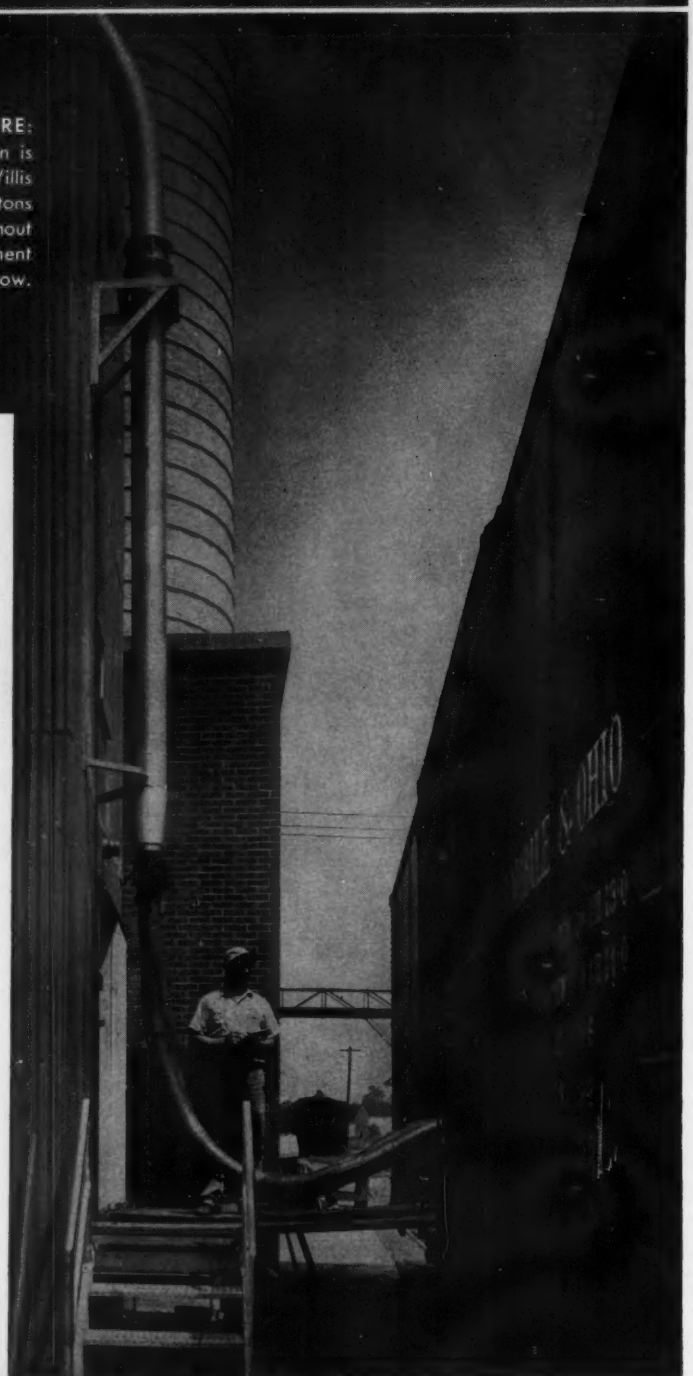
Maker says accurate spotting of loads is assured since device permits shifting load 6 in. each side of center in addition to holding load in place while truck backs away.

Truck automatically goes in reverse when holding attachment is actuated, allowing fast, efficient handling.

Further features are: Low step-height, full visibility, safety-brake control, zero-turning radius, and inching control.—*Automatic Transportation Co., 149 W. 87th St., Chicago.* **Circle 374 on Reader Service Card**

Want more information on any items? Just circle the key numbers on Reader Service Card, back of book

flowing air moves bulk feeds better



AUTOMATIC PRODUCTION STARTS HERE: This compact Airstream Conveyor installation is at Easton (Md.) feed mill of J. McKenny Willis & Son, Inc. Self-cleaning system unloads 25 tons per hour of soft meals for animal feed without dust, waste or mixing of meals. Vertical movement requires no more power than horizontal flow.

Efficient bulk materials handling is a major factor in any modern plant. Outmoded handling methods put a costly kink in production processes which are otherwise smooth and automatic.

A Dracco Airstream Conveyor can provide air-smooth bulk handling to supplement your other up-to-date operations. Airstream systems are readily adaptable to control and any degree of automation is possible. Versatile intake devices permit unmatched mobility in unloading areas. One-man supervision, with flow regulated from a central control panel, replaces costly manual handling.

Airstream Conveyors are enclosed and self-cleaning, permitting movement of different materials in quick succession without dust, waste or intermixing. Conveying lines require little space, conform easily to existing plant layouts, can be installed out-of-the-way without expensive structural supports.

For more information on how flowing air can move your bulk materials better and cut handling costs, call or write:

DRACCO DIVISION OF FULLER CO.
4045 East 116th Street • Cleveland 5, Ohio

New 32-page brochure presents detailed information on how Dracco Airstream Conveyors have solved bulk materials handling problems. Write for Bulletin 530.

DRACCO *airstream* conveyors
dust control equipment

Epuipment & Supplies

Cleans Parts Ultrasonically

Multi-purpose SonBlaster (Series 400) is a compact ultrasonic parts-cleaning unit for either industrial or lab use.

Contents of twin 400-ml. Pyrex beakers are agitated ultrasonically at the same time, hence two jobs can be done simultaneously. Further, larger single cleanings can be run in the stainless tank, with beakers removed.

Unit operates, at flip of switch, from 115v. 50/60-cyc. outlet.—*The Narda Ultrasonics Corp., Westbury, L. I., N. Y.*

Circle 375 on Reader Service Card

Highly Versatile Centrifuge

Nicknamed "Big Sam," this new Model SAMN-15007 Westphalia high capacity automatic desludger has already been put "on stream" in numerous continuous processing routines.

Applications are in clarification of various citrus and other juices, grape-juices and concentrates, wines, brewers' wort, molasses, beverage extracts, and press oils. It's further employed in separation of fish oil and essential oils, also in recovery of valuable liquids or solids from tank bottoms.

Unit is designed for "around-the-clock" operation, sludge being removed automatically and periodic shutdowns for bowl cleaning being eliminated. Capacities of 6,000 gph.

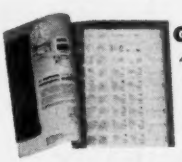
What's behind the SKILL in Cointreau Liqueurs?

In the Flemington, N. J., plant where fine Cointreau cordials are made, craftsmanship is worth far more than time. For an extra touch of skill in controlling sweetness, Cointreau reached for an accurate Neptune meter... and made impressive savings of time, too!

Sweetness comes from pure cane sugar. Two men formerly were needed to unload and stack the bags. Another man operated the steam-jacketed dissolving kettle. Scale weighing was necessary, and there were always fractional bags of sugar left over, with problems of spillage and storage.

Cointreau now purchases *liquid* sugar... with a Neptune Auto-Stop meter for accurate measurement. The meter controls the quantity *automatically*. Each batch now takes only a few seconds of one man's time.

Want to improve quality... save time? Invariably Neptune meters do *both*... at a cost lower than you'd think. Find out today.



GET THE FACTS
Ask for helpful Meter Data Bulletin 566 JF See Neptune Data Pages in Chemical Engineering Catalog.

neptune

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19 West 50th Street • New York 20, N.Y.

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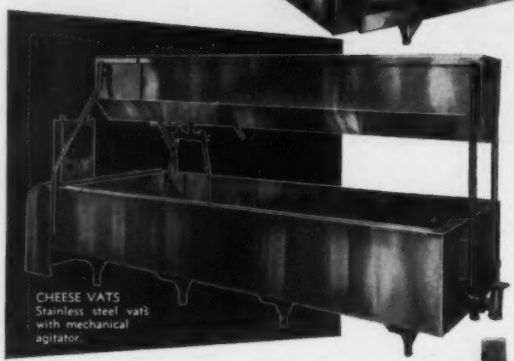
CIRCLE 137 ON READER SERVICE CARD 137

MUELLER

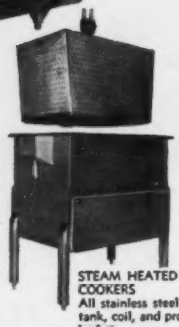
Food Processing Equipment

ROUND STAINLESS STEEL TANKS
Insulated, with or without refrigeration.

HORIZONTAL STAINLESS STEEL TANKS
Insulated, sizes from 150 through 2000 gallons. With or without heating or cooling coils.



CHEESE VATS
Stainless steel vats with mechanical agitator.



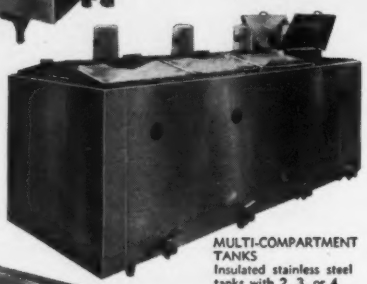
STEAM HEATED COOKERS
All stainless steel tank, coil, and product basket.

MANUFACTURING VERSATILITY SERVING THE FOOD INDUSTRY

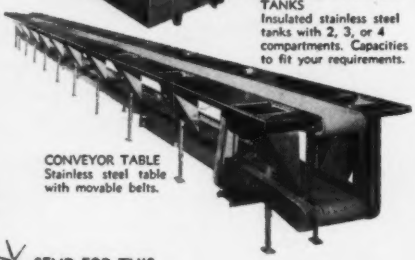
The Paul Mueller Company has earned a reputation for fabricating first quality food processing and handling equipment for the food industry

Let Mueller show you how to obtain custom-built results at production line economies. Although specializing in the stainless steels, all equipment is available in a variety of materials.

Write for more information and a free brochure designed to give you a capsule picture of the Mueller facilities, products, and personnel. Paul Mueller Company, P.O Box 150, Springfield, Missouri



MULTI-COMPARTMENT TANKS
Insulated stainless steel tanks with 2, 3, or 4 compartments. Capacities to fit your requirements.



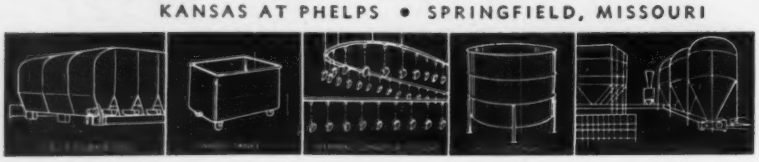
CONVEYOR TABLE
Stainless steel table with movable belts.

SEND FOR THIS FREE BROCHURE!

PM

PAUL MUELLER COMPANY

KANSAS AT PHELPS • SPRINGFIELD, MISSOURI

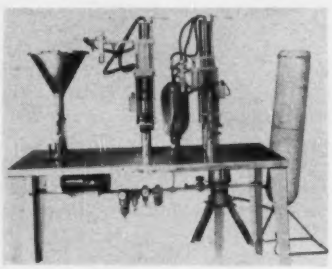


have been achieved with good efficiency.

In operation, liquid stream is fed to the disk-type bowl, where it is divided into many thin layers. The high centrifugal forces "tears" the various phases apart.

When liquid is to be clarified, solids are forced to periphery of rotating bowl. Here they collect and are automatically ejected at pre-set intervals into sludge chute. A 40-hp. Louis Allis motor powers unit.—*Centrico, Inc., Englewood, N. J.*

Circle 376 on Reader Service Card



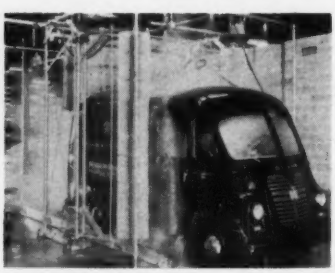
600-Cph. Aerosol Line

Designated the KP-1000, new economical semi-automatic aerosol packaging line is completely self-contained unit requiring only electric power, propellant, and product to be put in operation.

Unit is reported capable of producing up to 600 cans/hr., employing setup of piston filler, vacuum crimper, and pressure filler (0 to 300 gm.).

Design is primarily for regular runs by smaller and medium-size processors and as auxiliary equipment for large-volume operators.—*Kartridge-Pak Co., Franklin Park, Ill.*

Circle 377 on Reader Service Card



'Rig-Yourself' Truck Washer

New Junior Blackhall stationary truck washer comes in prefab, 'do-it-yourself' package.

Sized to take vehicles up to 8'-6" wide by 10'-6" high, unit employs

You can't tell National® Colors from Nature's best!

National Certified Food Colors capture the full beauty of natural fruits at their very peak of flavor. With unerring consistency, they reproduce those appetizing colors time after time..."telegraphing" the flavor before you actually taste it.

We have helped food processors use color creatively for more than 50 years. With the broadest range of primary and secondary colors made, we can match any shade you desire. We'll gladly put our long experience to work for you.

NATIONAL® CERTIFIED FOOD COLORS

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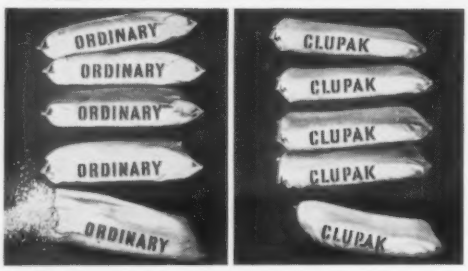
40 RECTOR STREET, NEW YORK 6, N. Y.
Atlanta Boston Charlotte Chicago Greensboro Los Angeles
Philadelphia Portland, Ore. Providence San Francisco
In Canada: ALLIED CHEMICAL CANADA, LTD., 100 North Queen St., Toronto 14

Allied Chemical

YOUR CLUE TO BETTER MULTIWALL SACKS... EXTENSIBLE CLUPAK PAPER

WIDE VARIETY of products now being shipped in CLUPAK paper multiwall bags includes:

Aluminum sulphate	Perlite
Ammonium nitrate	Pigments
Calcium carbonate	Plant foods
Calcium chlorate	Plaster of Paris
Carbon black	Powdered insecticides
Cement	Pulverized rock
Clays	Polyethylene crystals
Cotton seed meal	Salt
Dehydrated alfalfa	Sand
Feed	Seed
Flour	Soybeans and meal
Fertilizer	Steric acid
Frits	Sugar
Hydrated lime	Sulphate of potash
Meal	Talc
Oyster shells	



DROP TEST comparison demonstrates CLUPAK paper's ability to resist shock. Multiwall sack made with CLUPAK paper (right), survives many more test falls than sack (left) made with ordinary kraft.

ROUGH HANDLING in shipping emphasizes CLUPAK kraft's toughness, ability to stand up where failure often occurs with ordinary multiwalls. Even when new, lighter bag constructions are used, the CLUPAK trademark is your assurance the bag paper meets the most rigid of shipping requirements.

DISCOVERY GIVES PAPER NEW "*TOUGHNESS*" ...MAKES IT ABSORB SHOCKS INSTEAD OF TEARING

BETTER PERFORMANCE, LOWER COST! CLUPAK Extensible Paper opens a new era in paper . . . makes it virtually a new material, with unlimited applications. For CLUPAK paper has built-in *stretch* or extensibility which lets it absorb the shocks and strains that cause ordinary paper to rip, tear and puncture. The result is a new dimension in paper — *toughness*. In multiwall sacks, CLUPAK paper toughness delivers far better performance... often at lower cost, by permitting fewer multiwall plies and a net saving in total basis weight. And CLUPAK paper *flexibility* can mean additional advantages — faster filling, easier handling and stacking.

BE SURE TO LOOK FOR THIS TRADEMARK

EXTENSIBLE CLUPAK® PAPER*

**Clupak, Inc.'s trademark for extensible paper manufactured under its authority.*

KEY FACTS FOR BUYERS

1 CLUPAK kraft is the same as ordinary kraft except that it is stronger, tougher and more flexible.

2 CLUPAK paper can be made in many basis weights and with varying degrees of stretch. Printability, surface friction, porosity and other properties can be controlled as with ordinary paper.

3 CLUPAK paper toughness and flexibility open up unlimited new uses for paper. Clupak, Inc. carries on continuous research and development work and results are made available to all licensees.

4 CLUPAK, INC. permits the use of its trademark only on paper which meets this company's rigid toughness requirements.

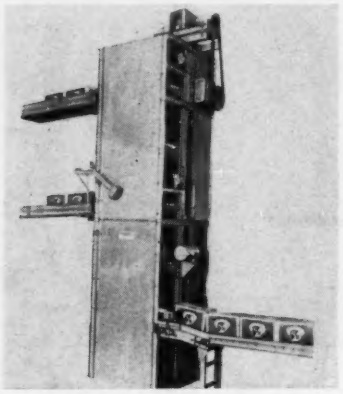
Clupak, Inc., 530 Fifth Avenue, New York 36, N.Y.

Buy CLUPAK paper and products made with CLUPAK paper from:

Albemarle Paper Mfg. Co.
Calcasieu Paper Co.
Canada Paper Co. (Canada)
Crown Zellerbach Corp.
Continental Can Company, Inc.
Dynas Aktiebolag (Sweden)
Hudson Pulp and Paper Corp.
International Paper Co.
St. Lawrence Corp., Ltd. (Canada)
St. Regis Paper Co.
Union Bag-Camp Paper Corp.
West Virginia Pulp and Paper Co.

pressure sprays for wetting and removing loose dirt, turning brushes for scrubbing sides, and a mop washer for roof cleaning.

Simple installation requirements of this "smaller fleet" washer are water line (at least 30-lb. pressure), concrete supportig floor, drain facilities, and 220/440v., 3 ph., 60 cyc. current source.—*Ross & White Co., Chicago Daily News Bldg., Chicago 6.* **Circle 378 on Reader Service Card**



Versatile Case Conveyor

Easy operation and maintenance mark new index-type vertical conveyor for moving cases.

Unit automatically receives, spaces, transports, and discharges individual cases at rates to 20/min., taking either one or two packages per carrier.

Occupying but 4x4-ft. floor space, plus 2 ft. 3 in. for automatic feed belt, conveyor handles packages ranging 10-15½-in. wide, 12-36-in. long, and 7-15-in. high. Carriers takes 180 lb.

There is allowance (see photo) for two or more discharge levels for cases leaving unit.—*Alvey Conveyor Mfg. Co., 9301 Olive St. Rd., St. Louis 22.*

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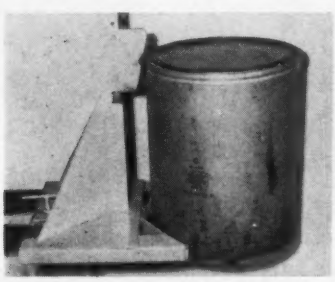


'Muscles' All-Size Drums

This versatile Grip-O-Matic lift-truck attachment is designed for picking up any kind of drum container.

AUTOMATIC BATCHING HANDBOOK

EVERYTHING YOU NEED TO KNOW ABOUT AUTOMATIC BATCHING

- HOW TO DO IT
- HOW MUCH IT COSTS
- WHAT YOU NEED
- HOW TO USE WHAT YOU HAVE
- HOW TO SELECT THE RIGHT SYSTEM

If you are now combining two or more ingredients in any kind of formula or batch, write now for this new *free* automatic batching handbook. It describes in detail how automatic batching works, how to convert existing plant facilities or plan new plants for automatic operation. It illustrates the latest batching systems available, lets you select the right type for your particular needs. Also shows you how to combine materials handling equipment, storage facilities, and weighing equipment for greatest economy, increased production. This is the newest, most complete handbook on automatic batching available—be sure to write for your free copy today!

HOWE

THE HOWE SCALE CO. • RUTLAND, VT.

A SUBSIDIARY OF SAFETY INDUSTRIES, INC.

CIRCLE 141 ON READER SERVICE CARD 141

MAIL THIS COUPON

Cyclone Fence, American Steel & Wire
Dept. H-1091, 614 Superior Avenue, N.W., Cleveland 13, Ohio
Please have your trained representative call on us to discuss our production problems.

Name..... Company.....

Address.....

City..... State.....

Let Cyclone carry your production load

Competitive market prices make production efficiency a more vital part of business success than ever before. Production waste, unnecessary manual handling, or time-consuming carting of products can add unnecessary expense to the price of your product. In many cases, a Cyclone Metal Processing Belt could help make your production line more efficient, thus making your product price more competitive.

We'd like the chance to send one of our trained salesmen into your plant to investigate your own production problems. Chances are he can show you, with facts and figures, exactly how a Cyclone Belt can be a blessing to your profit picture. His suggestions will be tailored to YOUR plant and YOUR product, not just a general sales pitch. There is absolutely *no obligation.*

USS and Cyclone are registered trademarks

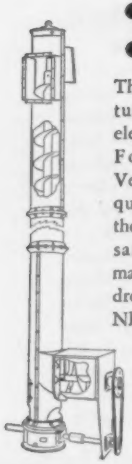
Cyclone Fence Dept.
American Steel & Wire
Division of
USS
United States Steel

Manufactured at Waukegan, Ill. and Oakland, Calif. • Sales Offices, Coast to Coast

CIRCLE 230 ON READER SERVICE CARD

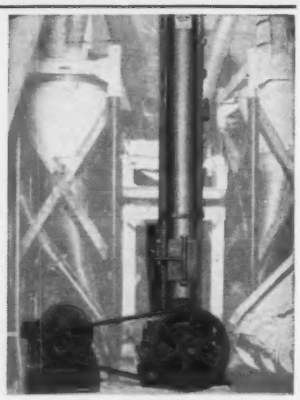
FOOD PROCESSORS!
THE *Rotor Lift* IS-

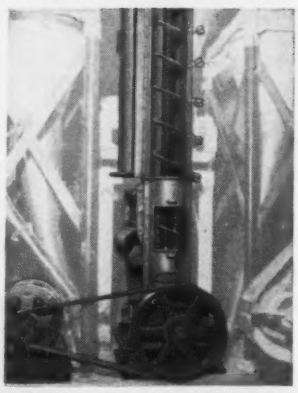
- QUICK OPENING
- EASY TO CLEAN
- FAST CLOSING



The quick opening-fast closing feature makes ROTOR LIFT screw elevators invaluable wherever Pure Food regulations are vital. Vertically-hinged split housing gives quick, complete accessibility for thorough clean-out with unexcelled sanitation control. Intake hopper may also be equipped with hinged drop bottom. WRITE FOR ENGINEERING CATALOG.

LOW CARBON STEEL
STAINLESS STEEL
GALVANIZED (HOT DIPPED)
8 BASIC TYPES • 4 DIAMETERS





SOUTHWESTERN
SUPPLY and MACHINE WORKS
OKLAHOMA CITY, OKLAHOMA

WORLD'S LARGEST MANUFACTURER OF VERTICAL HELICOID SCREW ELEVATORS

Equipment & Supplies

Strongly gripped, drums are released only when they are set down.

Head consists of two hardened jaws which clinch to container's bead. Jaws can be adjusted to various heights. Six different models of unit are available.—*Little Giant Products, Inc.*, 1559 *N.E. Adams St., Peoria, Ill.*

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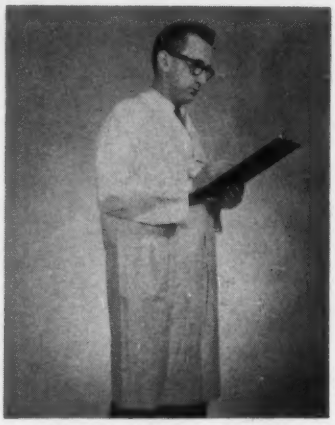

"One-Wear" Work Garments

Practical, low-cost line of disposable paper work clothing includes shirts, pants, aprons, gowns, lab coats, hats, boots.

Garments are made of a durable, lint-free, threaded-paper material that is lightweight, soft, and comfortable, similar to woven cloth. They may, if required, be autoclaved.

Maker cites paper clothing as reducing laundry, repairing, and in-plant handling costs—assuring fresh garments at all times with no frayed or patched appearance.—*General Scientific Equip. Co., P.O. Box 3038, Philadelphia 50.*

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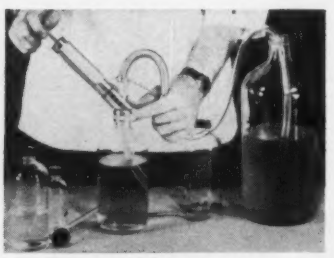
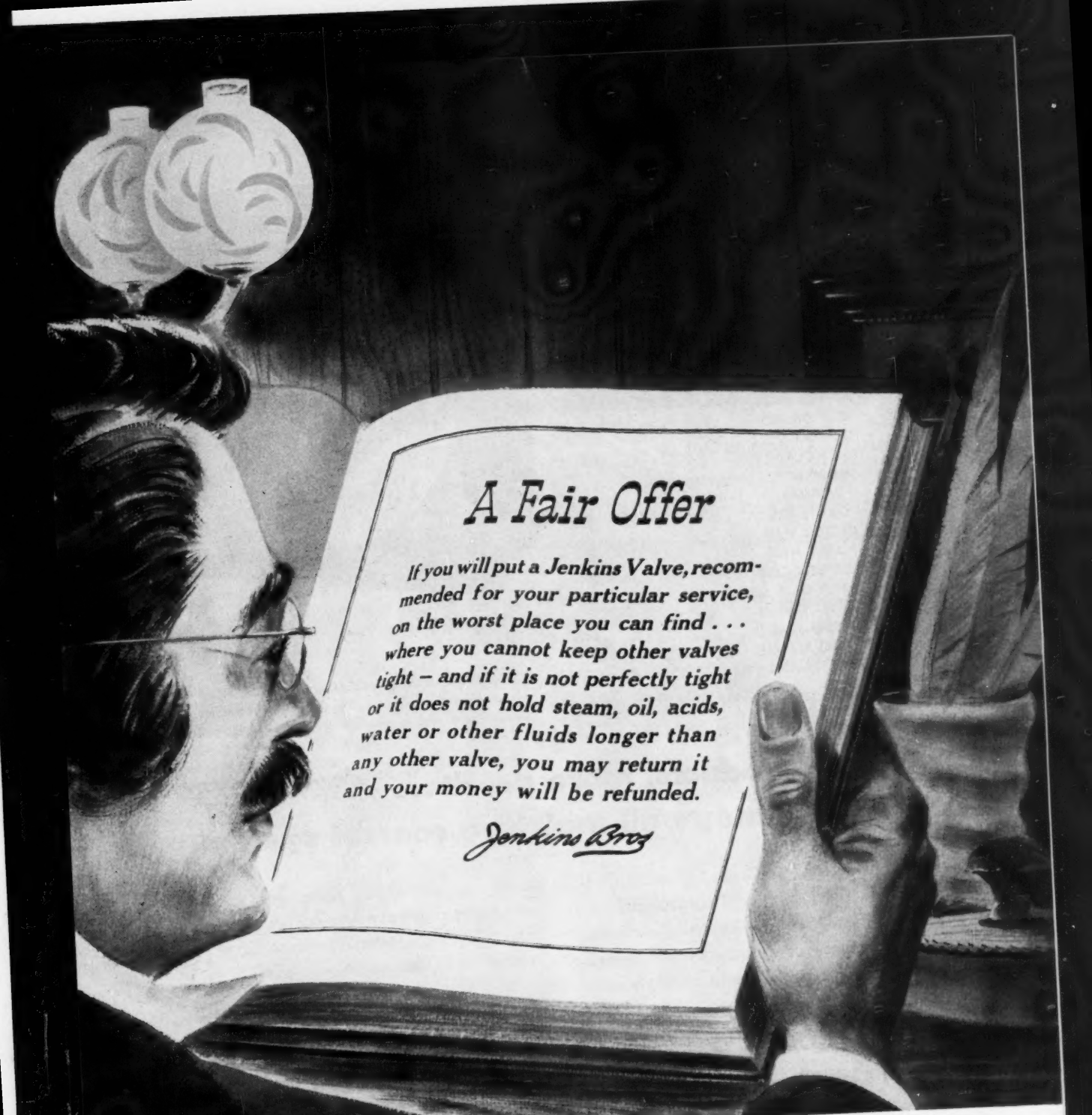


Sanitary Sampling Pump

This Model D "Golden Thief" vacuum pump is designed for new ease in sanitary sampling.

Liquids drawn never contact any


A Fair Offer
If you will put a Jenkins Valve, recommended for your particular service, on the worst place you can find . . . where you cannot keep other valves tight – and if it is not perfectly tight or it does not hold steam, oil, acids, water or other fluids longer than any other valve, you may return it and your money will be refunded.
Jenkins Bros

PUBLISHED AND PROVED FOR 90 YEARS

This simple, straightforward statement of selling policy was first published in 1869, five years after Jenkins Bros. was founded. It has been continued in full effect through 90 years of Jenkins Bros. history of making valves to a standard of quality that warrants such an unparalleled assurance to buyers.

SOLD THROUGH LEADING DISTRIBUTORS EVERYWHERE

JENKINS
LOOK FOR THE JENKINS DIAMOND
VALVES
JENKINS
SINCE 1864
Jenkins Bros

THE *MOIST-O-GRAPH* HAS BEEN TESTED AND PROVED WITH THESE MATERIALS:

POTATO SHEET
COTTONSEED
TOBACCO SHEET
FLOUR
OAT BITS
ALFALFA
OAT FLAKES
CASTOR BEAN
PEANUT MEAL
DRIED BEET BULB
BARLEY AND OATS GRASS
LIMA BEAN VINES
LINSEED MEAL
POTATO STARCH
PEARL STARCH

HONEYWELL *MOIST-O-GRAPH* measures moisture content from approximately 5% to 30% by resistance measurement, with a range of 0-100,000 megohms.

Better products, more profit... *AUTOMATICALLY* with a Honeywell moisture control system

Automation makes any process pay extra dividends in productivity, product improvement and profit. One of the many ways Honeywell can bring you the advantages of automation is through precise, automatic control of moisture in granular and sheet materials.

The Honeywell *Moist-O-Graph* system gives you positive quality control, and lets you maintain a profitable moisture balance in your products. It gives you a continuous, permanent record of moisture content. It leads the way to tangible savings in your drying operations, and lets you use your manpower more productively. Presently installed *Moist-O-Graph* systems have paid for themselves in six months.

Let Honeywell survey your process for best possible application of the *Moist-O-Graph* system. Get complete details from your nearby Honeywell field engineer. Call him today . . . he's as near as your phone.

MINNEAPOLIS-HONEYWELL, Wayne and Windrim Avenues, Philadelphia 44, Pa.

Honeywell

H HONEYWELL *First in Control*

part of pump, instead go via sanitary plastic tubing direct to sample receptacle.

Unit handles liquids up to consistency of syrup, as well as powdered solids of type that "seek own level." It fits containers with neck openings ranging from 22 mm. to wide-mouth jars.—*W & W Mfg. Co., P. O. Box 9311, Chicago 90.*

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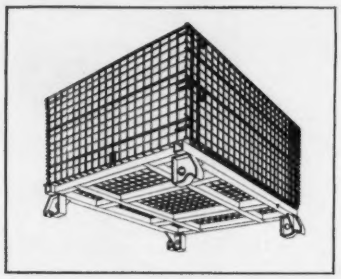

Efficient Wire-Type Toter

Of welded wire fabrication, new Clearview Cargotainer offers advantages of self-cleaning, space-saving collapsibility, and firm stacking.

Unit is engineered (base section) for minimum 30-in. length of lift truck forks, and it also lends itself to ready handling by pallet and platform trucks.

Available are all standard sizes, with capacities ranging from 500 to 6,000 lb.—*Tri-State Eng. Co. Washington, Pa.*

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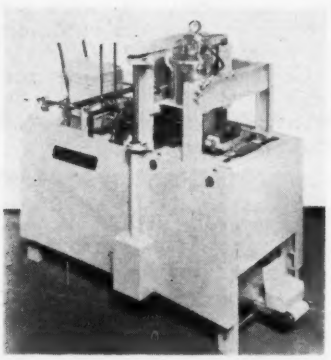
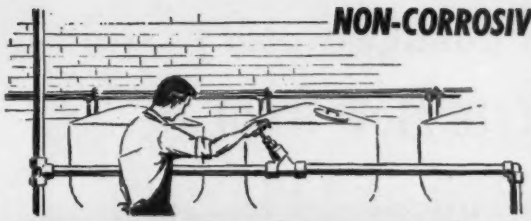


Forms Containers at 70/Min.

This machine, says maker, automatically converts low-cost blanks into perfectly shaped cartons or trays at speeds to 70 a minute.

Designated Model PG, it's readily adjusted for handling blanks from 5 to 22 in. long by 3½ to 16 in. wide. A feature is closed glue system de-



NON-CORROSIVE...NON-TOXIC

piping systems at low cost

MUELLER BRASS CO. PVC (POLYVINYL CHLORIDE)

RIGID PLASTIC PIPE AND FITTINGS

Mueller Brass Co. PVC rigid plastic pipe and fittings offer the food industry efficient, non-corrosive piping systems at substantial cost reductions. Solutions commonly used by the food industry, such as brine, acetic acid, alcohol, fats and oils will not corrode PVC pipe. The smooth inner wall of PVC prevents deposits from forming and allows a high rate of discharge at all times. The purity of liquids is positively protected. PVC is guaranteed non-toxic and will not impart foreign tastes or odors to the liquid it carries. Its light weight cuts installation time and expense and its permanent built-in finish reduces maintenance costs.

Low installation costs, reduced maintenance and the long, trouble-free life of Mueller Brass Co. PVC plastic pipe and fittings assure the food processor increased savings with each year of use.

NORMAL IMPACT PVC—good impact strength . . . maximum chemical resistance.

HIGH IMPACT PVC — maximum impact strength . . . high chemical resistance.

Pipe is fabricated in 20' lengths; ½" through 3" sizes—I.P.S. schedules 40 and 80. Fittings are available in ½" through 3" sizes; threaded and socket-type for schedule 80 and in socket-type only for schedule 40.

Write for the new Mueller Brass Co. Technical Brochure.

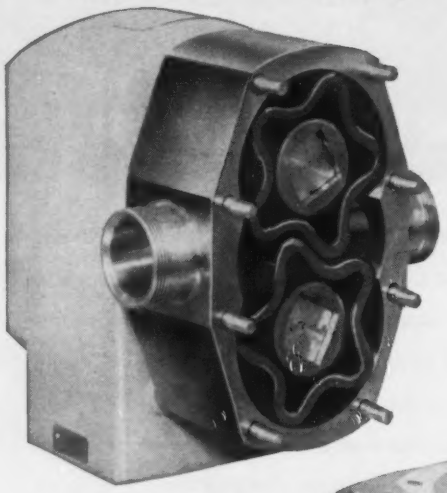
MUELLER BRASS CO.

PORT HURON 53, MICHIGAN

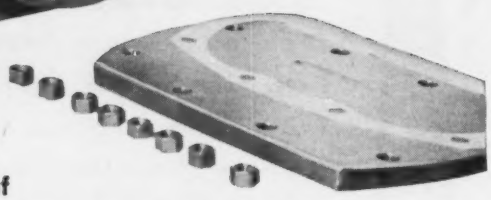
274-C

POLYETHYLENE PIPE AND PLASTIC FITTINGS, COPPER TUBE, VALVES AND FITTINGS

Creamery Package Rotary Pump Gives Uniform Flow from 29" Vacuum to 100 psig Pressure



STAINLESS SANITARY POSITIVE TYPE

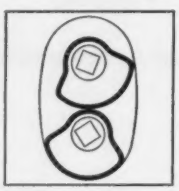


Rolling Action of Resilient Self-Adjusting Rotors Reduces Wear. Seals Can Be Replaced in Minutes. All Parts Can Be Replaced "On-the-Job". You Get Local Service—Local Engineering by Factory Trained Specialists.

The Creamery Package Stainless Rotary Pump with Resilient Rotors is ideally suited for smooth, continuous delivery of soups, syrups, slurries, pastes, mixes and dairy products, in a wide range of pressures and viscosities.

Sizes, capacities and drives are available for all requirements.

Large piece products, such as fruit cocktail, stews, cottage cheese and vegetables can also be pumped satisfactorily by using the newly designed single-lobe rotors pictured at the right.



Write for Bulletin H-1290.

THE *Creamery Package*® MFG. COMPANY
General and Export Offices:
1243 W. Washington Blvd., Chicago 7, Illinois
23 Factory Branches to Serve You Coast to Coast

CREAMERY PACKAGE MFG. CO. OF CANADA, LTD. 267 King St., West Toronto 2B, Ontario

146 CIRCLE 146 ON READER SERVICE CARD

Equipment & Supplies

signed to eliminate clean-up chores.

In operation, blanks feed from inclined magazine. A uniform glue pattern is applied to end flaps. Cartons or trays are then formed, with the glued sections being held securely in position during forming operation to permit glue to set firmly. —*Peters Mach'y Co., 4700 Ravenswood Ave., Chicago 40.*

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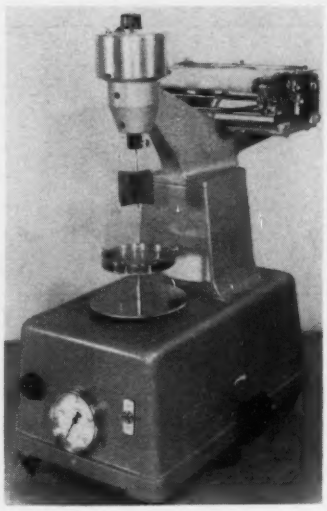

Improved Viscosimeter

New precision in determining viscosity and flow characteristics is reported achieved with this fully recording, completely linear "Visco-Corder."

Available with 15 paddle designs, unit readily gages such fluids as milk, chocolate, catsup, oils, pastes, gels, starches, etc. Changes in viscosity are automatically graphed.

Unit employs a stepless vari-speed drive (20 to 200 rpm.).—*C. W. Brabender Instruments, Inc., South Hackensack, N. J.*

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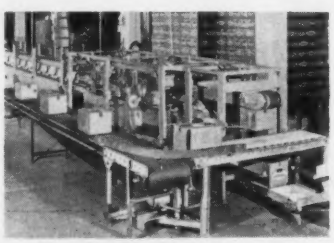

Advanced Case Assembler

Special new development is this automatic machine for assembling one-piece, solid-fiber, returnable bottle carriers. It handles up to 600

CIRCLE 147 ON READER SERVICE CARD→

Valley Fresh Sweet Dairy Whey—high quality dairy ingredient

Now—improve

QUALITY

and lower your food product ingredient costs

Discover the easy way to heighten flavor appeal, to improve texture, to extend shelf life. Watch your ingredient costs go down. Put Valley Fresh Sweet Dairy Whey to work for you.

This 100% dairy ingredient delivers uniformly superior results in virtually every type of food product. It improves bakery products, frozen desserts, candy, prepared mixes, smoked and canned meats, soft drinks and hundreds of others. Pound for pound, it is your most economical source of lactose (milk sugar) and lactalbumin protein.

And Valley Fresh Sweet Dairy Whey offers you this important extra: technical knowledge. At your disposal are the skill and experience of the world's largest whey products manufacturer.

Send for the facts and figures on Valley Fresh Sweet Dairy Whey today. For technical bulletins and information on the many other Western food ingredients, write Technical Service: Dept 16K.

Valley Fresh FOREMOST

WESTERN CONDENSING COMPANY

Appleton, Wisconsin

World's Largest Producer of Whey Products

This is Why the Nash is the Most Simple Compressor

It's the Nash!

There are no mechanical complications in a Nash Compressor. A single moving element, a round rotor, with shrouded blades, forming a series of buckets, revolves freely in an elliptical casing containing any low viscosity liquid. This liquid, carried with the rotor, follows the elliptical contour of the casing.

The moving liquid therefore recedes from the rotor buckets at the wide part of the ellipse, permitting the buckets to fill with gas from the stationary Inlet Ports. As the casing narrows, the liquid is forced back into the rotor buckets, compressing the gas, and delivering it through the fixed Outlet Ports.

Nash Compressors produce 75 lbs pressure in a single stage, with capacities to 6 million cu. ft. per day in a single structure. Since compression is secured by an entirely different principle, gas pumping problems difficult with ordinary pumps are often handled easily in a Nash.

Nash simplicity means low maintenance cost, with original pump performance constant over long periods Data on these pumps sent immediately on request

No internal wearing parts.

No valves, pistons, or vanes.

No internal lubrication.

Low maintenance cost.

Saves floor space.

Desired delivery temperature automatically maintained.

Slugs of liquid entering pump will do no harm.

75 pounds in a single stage.

NASH ENGINEERING COMPANY

313 WILSON, SO. NORWALK, CONN.

cases/hr. with but a single operator.

Initial unit (photo) is installed at Goebel Brewing Co., Detroit.

In action, case bottoms are first formed and glued, unit's compression section producing a positive, lasting bond between bottom flaps. Next, covers are formed and stitched. Mandrels are automatically removed and returned to unit's feed end.

The completed Concora short-flange cases, as they are known, are fed automatically to the production lines.

New case uniformity achieved is cited as contributing to new efficiency in automatic palletizing and depalletizing operations.—*Container Corp. of America, 38 S. Dearborn St., Chicago 3.*

Circle 386 on Reader Service Card

INGREDIENTS

New Coating for Nutmeats, named "Cozeen," is a nutritive additive for protecting shelf-life. It combines a corn protein (Zein) and acetoglycerides. Maker suggests processors test-run coating prior to its expected OK under new FDA law. Approval has already been granted for its use in military rations.—*The Al-Chem Laboratory, Inc., 702 Locust St., Bloomington, Ill.* (387)

Baked-Goods Speeder is GDL (glucono-delta-lactone), which takes role in chemical leavening to provide products of excellent volume and texture. When used in making bread, baking time reportedly is cut to mere 50 min.—*Chas. Pfizer & Co., Inc., 800 Second Ave., New York City 17.* (388)

Rennet Extract is now offered in handy 1- and 5-gal. 'cubitainers' under new 'American' quality trademark.—*Dairyland Food Laboratories, Inc., 620 Progress Ave., Waukesha, Wis.* (389)

NEW SUPPLIES

Silicone Spray, aerosol-dispensed, is "non-stick" release agent for treating equipment and materials employed in heat-seal packaging. Maker says it speeds operations, keeps units cleaner.—*Sprayway, Inc., Chicago 20.* (390)

Improved Coating for Dock Aprons, drives, parking areas, and the like, is new Black Top Seal. Applied by

Keep Your Product on the Move

Ashworth Omniflex Belt carries frozen asparagus . . . rapidly . . . economically

with ASHWORTH METAL PROCESS BELTS

Whether it is baking, deep frying, quick freezing, cooling or any other process operation, you can keep your product on the move better with a belt designed to the specific job.

Fabricated from any metal capable of being formed into wire, Ashworth Belts provide a conveying medium permitting processing in transit through temperatures from −50° to 2100° F. Wherever your product must go during processing, be sure to get the "right" belt for the job . . . consult an Ashworth engineer.

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CIRCLE 149 ON READER SERVICE CARD

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The sales punching-est words in food merchandising these days are "protein enriched." With General Mills Pro-80 Vital Gluten (80% wheat protein m.f.b.) you can raise the protein content of your foods to any level desired. Economically. Easily. Pro-80 provides these processing benefits:

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You should get all the facts about Pro-80 right now while interest in protein enrichment is still climbing. For more specific information covering your food product write:

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for BETTER RETENTION of ..... flavor • color • vitamins

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Sterilizer

Widely used by the largest food packers in the country . . . usually set up in a battery of 4 or 5 for one line of food at 120 cans per minute . . . made in three sizes to hold thirty, twenty, or fifteen cases of tall cans . . . equipped with one cage, one cage truck and one set of 96 trays . . . all shells tested to 40 lbs. hydraulic pressure for working pressures up to 20 lbs. Also ASME code stamping.

Write today for complete information and recommendations of sizes to meet your plant setup.

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Vertical Retorts • Brine and Pulp Tanks • Belt Conveyors • Shaker Graders • Rod De-Watering Reel • Rotary Washers • Scalders • Blanchers • Separators • Special Machinery for Food Processing.

Equipment & Supplies

either brush, squeegee, or spray, it is stated to offer specific protection for surfaces subjected to gas and oil products.—*The Monroe Co., Inc., 10703 Quebec Ave., Cleveland 6.* (391)

Adhesive for Labeling Polyethylene Containers is readily handled by conventional machines and gives 'quick grab' for speedy, permanent application of paper labels. This product, named Rubbatex, works equally well with either flexible or semi-flexible poly units.—*Rubba, Inc., 1015 E. 173 St., N. Y. C.* (392)

Cooling-System Water Conditioner, called Keego, is special agent for curbing deposits and stabilizing heat transfer, thus reducing loads on equipment.—*Wyandotte Chemicals Corp., Wyandotte, Mich.* (393)

Filter - Fabric Patching Cement named Vicel is solvent-type that dries to form tough film. It's suitable for repairing breaks in press cloths, centrifuge bags, rotary vacuum filter cloths, etc.—*Technical Fabricators, Inc., 136 Washington Ave., Nutley, N. J.* (394)

King-Size Rubber Bands—up to 6 ft. long and stretching to 18 ft.—afford quick, simple means of bundling lightweight cartons, banding layers of cases to 'steady' pallet loads, and clustering cans and other items.—*B. F. Goodrich Co., Akron, Ohio.* (395)

New Oil for Precision Instruments is Anderol L-281. It's synthetic product specially applicable for protective lubing of timers, key bearings, pneumatic and hydraulic units.—*Lehigh Chemical Co., Chestertown, Md.* (396)

BRIEFS

New Spray Nozzles for air washers, evaporative condensers, cooling towers, etc., are non-corrosive units injection-molded of Tenite butyrate. Designated as the Hydo line, they come in seven capacities (.8 to 7 gpm.) and three sizes ($\frac{3}{8}$, $\frac{1}{2}$, and $\frac{3}{4}$-in.).—*Austin Mfg. Corp., 305 Perry Bldg., Austin 1, Tex.* (397)

Unit-Feed Timing Screw, the Kinsley, is custom-made for accurate handling of any shape glass, metal, or plastic container on packaging line. Device is engineered for precise pickup, movement, and discharge of units in conjunction with fillers, cap-

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Now you can turn to one major source of supply for your speciality adsorbent needs. Johns-Manville introduces Celkate® synthetic magnesium silicates and Micro-Cel® synthetic calcium silicates—first of a new line of adsorbents developed for a wide range of uses in industry.

Painstaking laboratory tests and actual plant operations have proved the efficiency of these adsorbents in removing free fatty acids from vegetable and animal oils, solvents, and lard . . . in removing color and odor from lard, edible oils, naphthalene, stearates, and kerosene.

The unusually light color of Celkate and Micro-Cel make them adaptable to countless industrial sorption problems. They provide distinct flavor improvements in the processing of many foods. They are also used in the sorption of soluble iron from glacé syrups.

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SOME TYPICAL PROPERTIES		
Type	Micro-Cel synthetic calcium silicate	Celkate synthetic magnesium silicate
Color	off-white	off-white
loose weight (lb/cu. ft.)	12.7	13.5
Absorption, % by wgt.	260 (water)	170 (oil)
pH	9.6	7.5
Wet density (lbs/cu. ft.)	17.4	22.5
150 Mesh (residue)	Trace	Trace
Moisture % (free) avg.	6.5	3.5

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CIRCLE 151 ON READER SERVICE CARD 151

Food Industry Leaders

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Reduced Handling Costs Mean Bigger Profits

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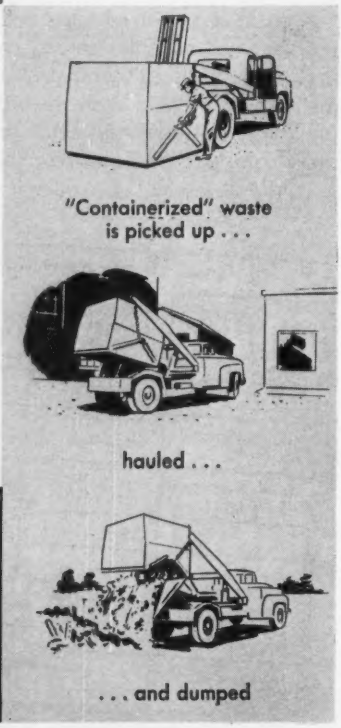
Enclosed temporary storage of waste, sludge, food scraps and trash is the key to plant cleanliness and low-cost disposal. Food industry leaders place clean, big-capacity Dempster-Dumpster Containers at major inside and outside accumulation points. Waste is "Containerized" as it generates . . . costly re-handling is eliminated. One man and one truck-mounted Dempster-Dumpster dispose of all waste from your plant . . . picking up, hauling and dumping Containers on a planned shuttle schedule. You may own this low-investment System or your local Dempster-Dumpster Contract Hauler will furnish the Containers and empty them for a nominal fee. Name of your area Contract Hauler furnished on request. Write today for your copy of the free manual, "How to Cut Waste Disposal Costs."



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Please send without obligation your new booklet, "How to Cut Waste Disposal Costs."

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Firm.....

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THE DEMPSTER DUMPSTER® SYSTEM

pers, labelers, or the like.—Arthur Colton Co., 3400 E. Lafayette, Detroit 7. (398)

Retractable Electric Cords for standby refrigeration of truck-trailers cut replacement costs, reduce hazards. Called Reefer Koiled Kords, rugged lines spring up away from truck wheels or dangerous contacts with water, oil, and grease on garage floors or lots.—Autac, Inc., New Haven, Conn. (399)

Miniature Thermostat (Model 32411) is offered for precision cooling and high limit control. Unit is designed for inherent sensitivity to 1 deg. F. Adjusting range: –20 to 275F.—Fenwal Inc., Pleasant St., Ashland, Mass. (400)

Vibrator Inducer (Vibrolator BD-10) is special lightweight air-impulse unit that mounts in any position with single bolt. It's suitable for impelling materials from bins or hoppers, ranging to 4 cu. ft. capacity.—Martin Engineering Co., Neponset, Ill. (401)

Circle key numbers on Reader Service Card

Strataflo

CHECK VALVES

for semi-solid and liquid food handling equipment

New valve resists acids, will not contaminate

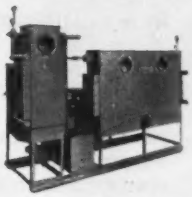
The new No. 3300 Strataflo Check Valve is designed to eliminate many of the problems encountered in semi-solid and liquid food handling equipment. Acids cannot harm the rugged one-piece body which is cast of a high nickel alloy. A large port area and unique straight line flow give greater capacity with low restriction. There are no "pockets" to fill up and encourage contamination. Easily cleaned by back-flushing. Leak-proof Neoprene poppet is non-toxic, odorless and tasteless. Valve will operate in any position; 200 lbs. working pressure. Write for Bulletin 15001 for information and prices.

STRATAFLO PRODUCTS, INC.
FORT WAYNE, INDIANA

CIRCLE 232 ON READER SERVICE CARD

KATHABAR® SYSTEMS

Give these advantages to specifying engineers:



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Now you can design spaces to maintain air sterility as scientifically as temperature and humidity. Only Kathabar enables you to calculate bacteria gain and maintain design limits of 5 micro-organisms per 10 cu. ft. or less, continuously.

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Permanently stop condensation on walls, floors, products. Dry up exposed water (bacteria breeding ground) no matter what your dry bulb. Results proved (you check) almost anywhere: breweries... candy plants... cereal plants... bakeries... sugar refineries. Name your required conditions (grains/pound and dry bulb) for process, storage, testing: Kathabar systems deliver.

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CIRCLE 153 ON READER SERVICE CARD

2-year acid test! Open motor beats enclosed type at its own game

In a tough acid pump installation, Dow Chemical's Texas Division experienced no end of motor troubles. It seemed nothing could stand up in that humid, corrosive atmosphere. Reports Dow: "Even with totally enclosed motors, winding failures were frequent." And, they might have added, expensive.

Then came *Super-Seal* motors — Allis-Chalmers open-type motors with amazing *Poxeal* insulation. A durable case of epoxy-resin encloses the winding end turns and slot portions of the stator . . . the most complete protection ever developed. Result? The *Super-Seal* motor, after two years of continuous operation in the acid area, is as good as ever. So good, in fact, that Dow has ordered 150 *Super-Seal* motors for a new chemical plant at Freeport, Texas.

Isn't it time to revaluate *your* motor standards? There's a good chance that costly enclosed motors are no longer needed. Contact your A-C representative or distributor, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

Super-Seal and *Poxeal* are Allis-Chalmers trademarks.

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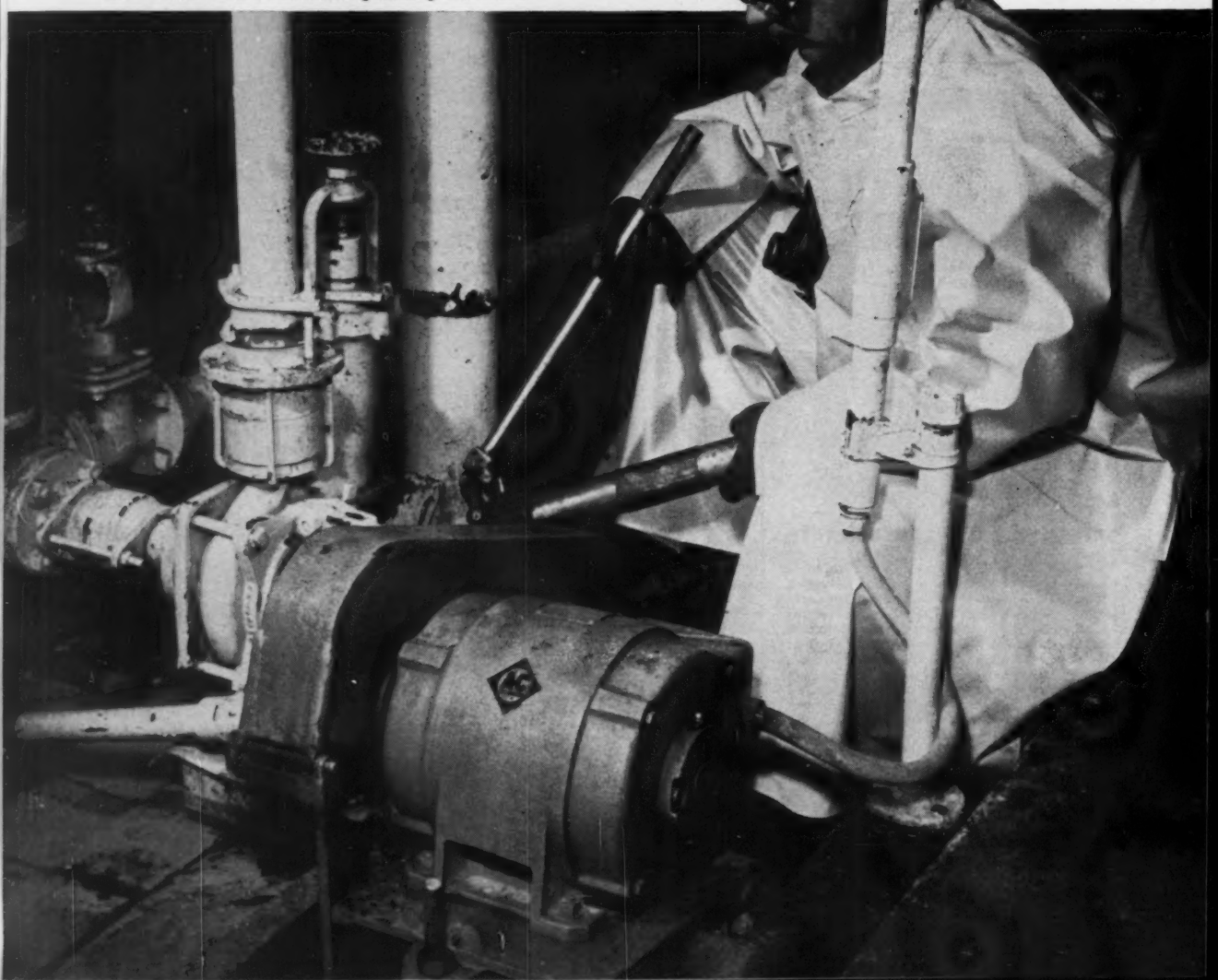
SUPER SEAL

A-1036-G1



ACID AREA APPLICATION. Safety equipment and clothing are a "must" for personnel in the acid atmosphere of Dow's chlorine plant at Freeport, Texas. This *Super-Seal* motor came prepared, too — with *Poxeal* insulation guarding the stator.

JUST OFF THE PRESS

PLANT ENGINEERING

Submersible Sump Pump. Details advantages of model for emergency or permanent use. 8p.—Deming Co., Salem, Ohio. (411)

Low Temperature Refrigeration. Details 2-stage ammonia compression system. 4p.—Creamery Package Mfg. Co., Chicago. (412)

Air & Vacuum Pumps. Details construction, dimensions, capacities, performance, and installations. 16p. —Leiman Bros., Newark, N. J. (413)

Screw Conveyor Drive. Gives dimensions, prices, and selection tables for unit consisting of reducer, packing gland, and shaft, that may be mounted in any position. Each of 4 sizes available in 3 ratios. 16p.—Dodge Mfg. Corp., Mishawaka, Ind. (414)

Shell-Ice Makers. Details operating principle, cites advantages. 8p.—Frick Co., Waynesboro, Pa. (415)

Poly-V Belt for Small Machinery. Pitch diameter as small as 0.8 in., and pitch lengths from 8 to 98 in. 4p.—Raybestos-Manhattan, Inc., Passaic, N. J. (416)

Packaged Boilers. Details advantages of 2-pass designs over 3- and 4-pass types, illustrates "spinning gas technique." 4p.—Boiler & Eng. Supply Co., Phoenixville, Pa. (417)

Feedwater Heater Valves. Describes 3-way units for simplifying bypass arrangement. 4p.—Schutte & Koerting Co., Cornwells H'ts, Pa. (418)

Water Treatment. Describes unit that combines coagulation, flocculation, sedimentation, and sludge removal. 4p. —Process Engineers, San Mateo, Calif. (419)

Electromagnetic Pulley. Describes new units, gives tables and formulas to help select right size. 8p.—Stearns Magnetic Products, Milwaukee. (420)

Stainless Steel. Information on all commercial sheet and strip grades produced by firm. Features comparative corrosion resistance tables. Describes physical properties and analyses, surface finishes, fabrication, maintenance, and bacteria cleanability. 36p.—Washington Steel Corp., Washington, Pa. (421)

Plug Valves. Describes coated types, with tables of recommended applications and installations photos. 8p. —Rockwell Mfg. Co., Pittsburgh. (422)

Timing Belt Drive. Gives principles and advantages of models in 5 different pitches. 4p. — Allis-Chalmers, Milwaukee. (423)

Plant Engineering Data. Convenient tables, formulas, and graphical symbols summarizing electrical data, properties of materials, heat transfer, steam information, measurements, etc. 120p. — Westinghouse Electric Corp., Pittsburgh. (424)

Heat Exchangers. Covers design and application of firm's 6 standard models in sizes to 1200 sq. ft. 16p.— Struthers Wells Corp., Warren, Pa. (425)

Heat Transfer. Describes complete line of equipment, and advantage of firmed tubes. 4p.—Brown Fintube Co., Elyria, Ohio. (426)

Dehumidifier. Describes operation and control of unit that uses liquid absorbent. Contains installations photos. 4p. — Niagara Blower Co., New York City. (427)

Flexible Couplings. Tells how to select them, illustrates installation and maintenance procedures.—Chain Belt Co., Milwaukee. (428)

Submersible Pumps. Details uses and applications in plant water systems, reservoir pumping, etc. 4p.—Layne & Bowler, Inc., Memphis, Tenn. (429)

Plug Valves. Data on new 4 & 5-port items with non-lubrication feature.—Continental Mfg. Co., N.Y.C. (430)

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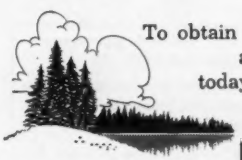
Never before have women shoppers been so protein- and nutrition-conscious. Leading manufacturers of many food and drug products are discovering that dried TORULA Yeast enrichment helps boost sales.

TORULA Yeast exceeds U.S.P. standards for B complex factors and protein. And the taste is bland for easy blending with your product. Lake States Yeast is produced in sterile media, and constant quality control assures you of purity and stability for long shelf life. Most important of all, TORULA Yeast provides the necessary enrichment at *low cost.*

To obtain complete information and a liberal test sample, write today, stating your application.



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ORANGE SOLID OIL

is famous for protecting machinery

Keeps production--UP! Maintenance repairs--DOWN! Lasts two to four times as long as ordinary greases. Saves bearings, material, power, time...and...labor.

SINCE ancient times, the shield and broad sword have been symbols of protection. And for over half a century the long-lasting, super lubricating film of Orange Solid Oil has been famous for protecting vital equipment. Now, Orange Solid Oil has been improved. It has greater clarity, brilliance, transparency--with increased lubricating, sealing, waterproof and rust protection properties. Leading manufacturers of dairy, cheese, creamery, ice cream and food equipment use and recommend it because--it does an outstanding job...and...stays on the job four times longer.

1--Pure, unadulterated petroleum solidified oil.

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Over 200 leading distributors from Maine to California stock Orange Solid Oil. Packed in 4 oz. tubes...and...1, 10, 25, 100, 225, and 375 pound containers. Quick delivery from your local distributor. If he can't fill your order--phone, wire, or write for name of your nearest source of supply.

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ORANGE MULTI-PURPOSE LUBRICANT--ideal for small industries. One inch graduated filling spout perfect for lubricating electric motors, other appliances. 8 oz. tubes, packed 12 to the carton.

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PROCESSING

Food Pump. Introduces single lobe rotary model for handling cottage cheese, peaches, etc., up to ¾ in. particle size.—Creamery Package Mfg. Co., Chicago. (431)

Vibrating Screens. Data on 12 types in 212 sizes. Covers extensive line to meet variable particular operating conditions, material characteristics, and capacities. Contains information on screen cloths and accessories. 48p. —Link-Belt Co., Chicago. (432)

Mixers. Quick reference for every-day plant operations includes engineering constants, short-cut tables, and formulas, plus photos and description of firm's equipment. 8p.—Falcon Mfg. Div., First Mach'y. Corp., Brooklyn, N. Y. (433)

Liquid Sprayer. Details, simplified dispenser for exact individual application at high speeds. Has been successfully used for ascorbic acid, M.S.G., etc. 2p.—Morton Salt Co., Chicago. (434)

"Acronize." History and background of development of antibiotic for perishable foodstuffs, with details on method of application for fish. 36p.—American Cyanamid Co., N.Y.C. (435)

Hydrogen Generators. Describes new packaged models. Contains flow chart and tables of capacities, utilities, and dimensions. 4p.—Gas Atmospheres, Inc., Cleveland. (436)

Package Milk Drying. Details plant for small dairy operator. 4p.—Blaw-Knox Co., Mora, Minn. (437)

Vibrating Screens. Describes unit with 3-D motion — horizontal, vertical, and gyratory. 2p.—De Laval Separator Co., Poughkeepsie, N. Y. (438)

Meat Curing. Tells how pink color is achieved. Discusses chemistry of pigments, and changes that take place during curing, deviations such as "blackening," "spotting," "greening," etc. 18p.—Amer. Meat Institute Foundation, Chicago. (439)

Metering Pumps. Gives details on selection and application.—Ross Llewellyn, Inc., Chicago. (440)

Food Processing. Cites firm's long experience, and tells how it has helped solve many unusual food problems. Illustrates equipment, describes facilities for research, in-plant testing, sales, and service. 34 p.—Cherry-Burrell Corp., Cedar Rapids, Iowa. (441)

"Water Knives." Selection guide to flat spray nozzles for any type of washing, cleaning, descaling, and cooling operations. 12p.—Chain Belt Co., Milwaukee, Wis. (442)

Deodorizers. Details typical 7,500 lb./hr. system, with flow diagram of packaged deodorizing plant. 6p.—Girdler Process Equipment Div., Louisville, Ky. (443)

PACKAGING

"Mini-Sealer." Low-cost, moderate production carton gluer for semi-automatic operation. — Alford Package Machines, Inc., Ridgefield Park, N. J. (444)

Bread Weight Controller. Tells how machine automatically reduces overscaling and "giveaway," plus comparison graphs that indicate savings. 6p.—FMC Packaging Mach'y Div., Philadelphia. (445)

Checkweigher. Describes simplified adjustments & weight settings of firm's new model that handles in-motion packages, slabs, and other items weighing 50-200 lb. 4p.—Toledo Scale Corp., Toledo, Ohio. (446)

Liquid Fillers. Details firm's high-speed units for plastic and glass containers from 1 dram to 12 oz. 4p.—Popper & Sons, Inc., N.Y.C. (447)

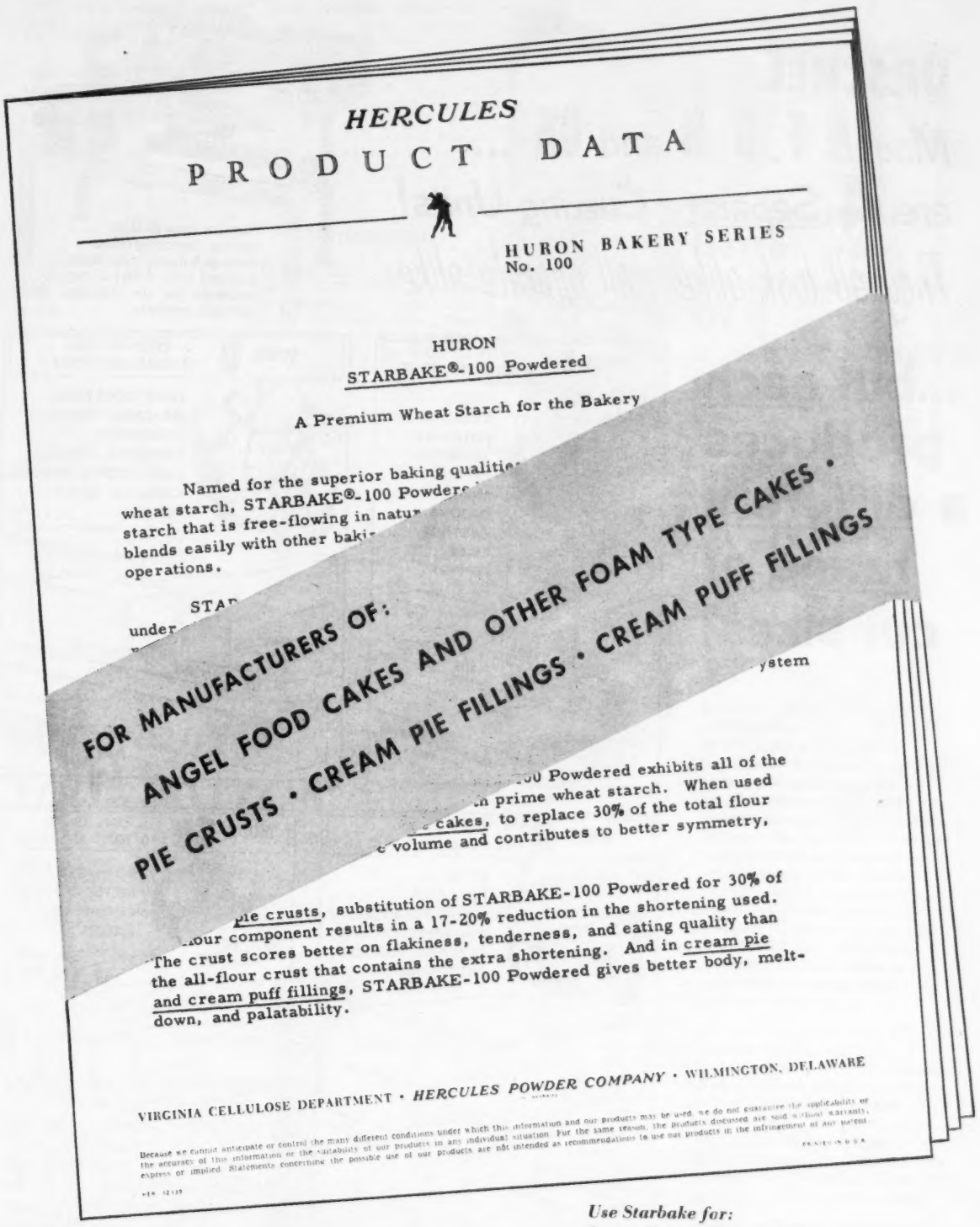
Tape Sealers. Data on firm's machines for cannisters and drums.—White Co., Brooklyn, N. Y. (448)

Cellophane. Basic characteristics, recommended usages for new polymer-coated highly durable film. 4p.—E. I. du Pont de Nemours & Co., Inc., Film Dept., Wilmington, Del. (449)

MATERIALS HANDLING

Driver Training. Instructors' manual covers good practices, construction details of principal truck types, written examination for trainee, other helps. 20p. — Automatic Transportation Co., Chicago. (450)

Film Catalog. How to obtain loan of 63 films on monorail and crane systems, fork lift trucks, handling operations in fruit and grocery warehouses, bottling plants,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PRODUCT DATA
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A Premium Wheat Starch for the Bakery
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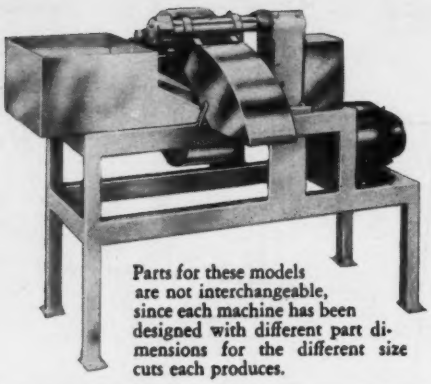
CIRCLE 157 ON READER SERVICE CARD 157

URSCHEL

Models F, G, H *and* GK ... *are* 4 *Separate Cutting Units!*

They all look alike...all operate alike



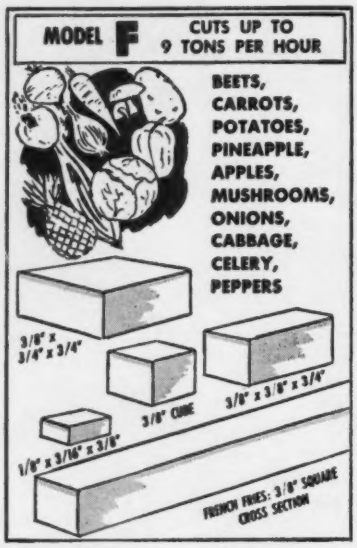
Parts for these models are not interchangeable, since each machine has been designed with different part dimensions for the different size cuts each produces.

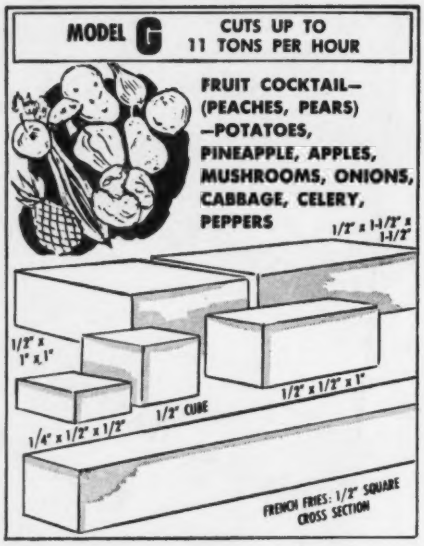
...but each produces a different range of cut sizes!

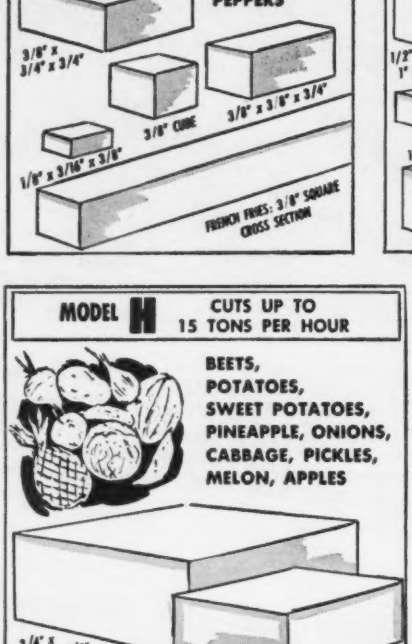
The product to be diced is fed first to the inside of a slicing shell, where it is then rotated by an impeller at high speed. Centrifugal force causes product to slide around the inside surface of slicing shell. As product approaches top of this shell it slides over an adjustable slicing gate which controls slice thickness. Slicing knife is at top of slicing shell. At the instant of slice, cross cut knives ride down, cutting slice crosswise into strips, or french fry cuts. These knives throw the product into the revolving circular knives that cut the strips into cubes.

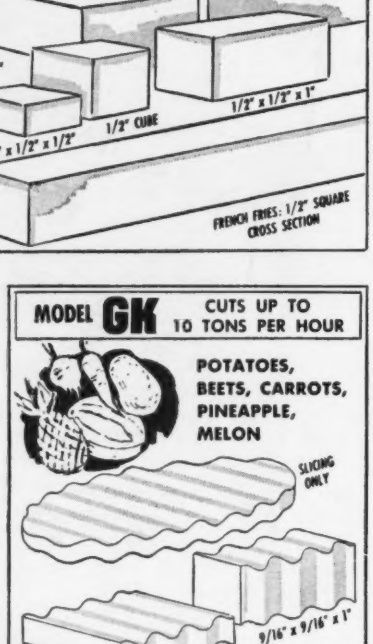
This new cutting principle has many advantages over previous methods. When slicing any product with a knife, the product tends to crack parallel with the knife's edge, particularly in brittle, root vegetables. Product cracking is overcome by cutting parallel with the strains set up, thus eliminating strains and the resultant cracking.

Product damage is eliminated by moving the product in a straight line from the time the first cut is made until the last cut is made, which reduces impact and crushing, and makes possible the high operating speed and quality of cut produced.


MODEL F
CUTS UP TO 9 TONS PER HOUR
BEETS, CARROTS, POTATOES, PINEAPPLE, APPLES, MUSHROOMS, ONIONS, CABBAGE, CELERY, PEPPERS
3/8" x 3/4" x 3/4"
3/8" CUBE
3/8" x 3/8" x 3/4"
1/8" x 3/16" x 3/8"
FRENCH FRIES: 3/8" SQUARE CROSS SECTION


MODEL G
CUTS UP TO 11 TONS PER HOUR
FRUIT COCKTAIL—(PEACHES, PEARS) —POTATOES, PINEAPPLE, APPLES, MUSHROOMS, ONIONS, CABBAGE, CELERY, PEPPERS
1/2" x 1-1/2" x 1-1/2"
1/2" x 1" x 1"
1/2" CUBE
1/2" x 1/2" x 1"
1/4" x 1/2" x 1/2"
FRENCH FRIES: 1/2" SQUARE CROSS SECTION


MODEL H
CUTS UP TO 15 TONS PER HOUR
BEETS, POTATOES, SWEET POTATOES, PINEAPPLE, ONIONS, CABBAGE, PICKLES, MELON, APPLES
3/4" x 1-1/2" x 1-1/2"
1/2" x 1" x 1"
3/8" x 3/8" x 3/4"
3/4" CUBE


MODEL GK
CUTS UP TO 10 TONS PER HOUR
POTATOES, BEETS, CARROTS, PINEAPPLE, MELON
SLICING ONLY
9/16" x 9/16" x 1"
1/4" x 1" x 1"
FRENCH FRIES: 9/16" SQUARE CROSS SECTION

PRECISION HIGH-SPEED FOOD CUTTING EQUIPMENT

URSCHEL LABORATORIES INC.
VALPARAISO, INDIANA

Designers and manufacturers of precision, high speed cutting equipment for food products

etc. 16p.—Material Handling Institute, Pittsburgh, Pa. (451)

Pallet Loader. Cites advantages with pictorial breakdown of synchronized 3 components of automatic system. 4p.—Lathrop Paulson Co., Chicago. (452)

Pneumatic Conveying Systems. Details major components of equipment for flour and feed mills, food plants, etc. 4p.—Sprout-Waldron & Co., Inc., Muncy, Pa. (453)

SANITATION & MAINTENANCE

Spray Cleaner. Describes unit for mechanical or automatic washing of farm bulk milk pick-up trucks.—Oakite Products, Inc., New York City (454).

Drum Cleaner. Describes solution-to-rinse-rack combination of bath tank and lift truck for loosening outside coatings and inside residues. 4p.—Drumatic Corp., San Francisco. (455)

Waste Disposal. Discusses "hidden costs" of conventional systems, details advantages of firm's equipment such as push-button control, automatic action, low-cost maintenance, etc. 12p.—Wandel Machine Co., Pomeroy, Pa. (456)

Conveyor Belt Repair Materials, plus cleats and kits. 4p.—Rema-Tech, Inc., NYC. (457)

MANAGEMENT

Glass-Ceramic Progress Report. Tells how firm has experimentally melted nearly 3,000 different types, and deals with two now available in commercial quantity. 8p.—Corning Glass Works, Corning, N. Y. (458)

Visual Communication. Covers visual and psychological aspects of package design, and describes company's services. 6p.—U.S. Testing Co., Hoboken, N. J. (459)

Safety. Tips on eliminating office accidents.—National Safety Council, Chicago. (460)

Food Technology. Cites ways in which applied chemistry can solve processing problems.—Foster D. Small, Inc. (461)

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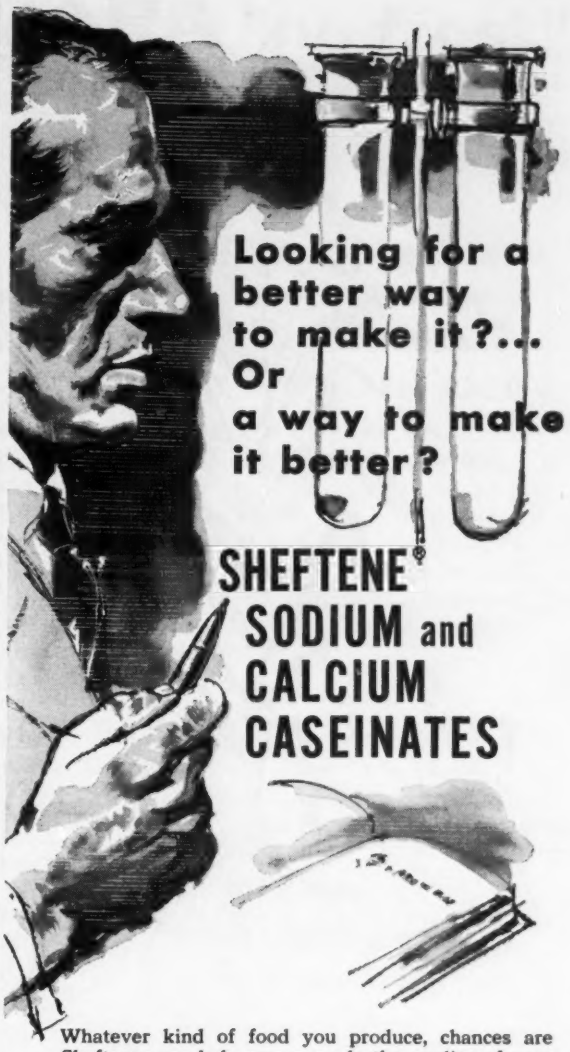

Whatever kind of food you produce, chances are Sheftenes can help you upgrade the quality of your product or even improve its manufacturing process ... Or both!

Primarily Sheftenes are known as a high-quality protein supplement, rich in lysine and other essential amino acids. But they offer a wide assortment of functional advantages as well.

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As a fat-blocking ingredient to prevent excessive absorption of fat in frying of doughnuts.

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As a low-calorie stabilizer in ice cream for diabetics.

As an agent to assure the keeping quality of ice cream.

Cereals: As a supplement to improve the "amino profile" of grain cereal products.

Infant Foods: As a high-quality, high-protein supplement in infant and special dietetic products.

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CIRCLE 159 ON READER SERVICE CARD

CLINTON can do it with Corn

simple? no!

as complex as life itself

At Clinton we learn new things about corn almost every day.

Corn is sustenance and shelter. It is clothing and confections—bread and beer. Corn is life—but only with the help of man. Its seed left in the field will wither and rot—but planted and cultivated by man it will drive roots three feet into the ground and stalks as high as fifteen feet into the air. It will thrive and create the raw materials for the well-being of man.

Clinton serves the FOOD industry

Clinton corn syrup and dextrose are used by leading packers of fruits and vegetables to improve the color, flavor and texture of their products. Clinton's uniformly controlled, quality products will meet your manufacturing requirements. Consult your Clinton salesman. He will provide product information, arrange for prompt technical service, or assist you in any way possible.

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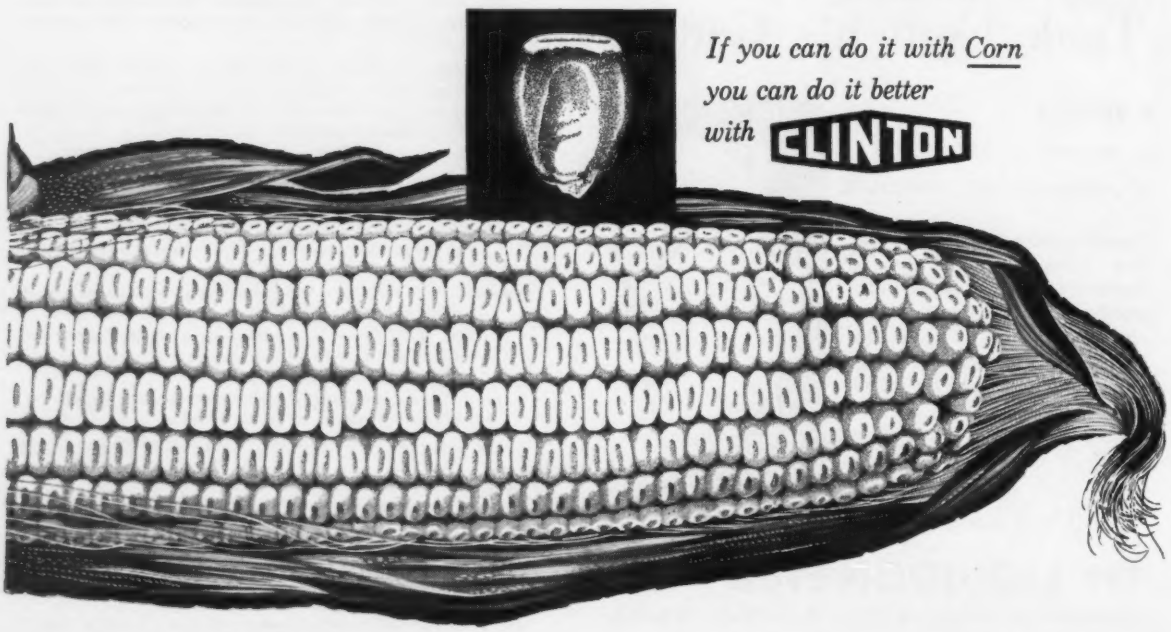
SUGARS • OILS • LACTIC ACID
AND OTHER PRODUCTS FROM CORN



If you can do it with Corn
you can do it better
with CLINTON

USEFUL NEW BOOKS

Latest Food Field Reference

CONVERSION FACTORS AND TECHNICAL DATA FOR THE FOOD INDUSTRY. *Compiled by C. G. Harrel and R. J. Thelen. Burgess Co., 426 S. 6th St., Minneapolis 15. 1959. 1426 p. Price:* $20.

This exhaustive manual is the 6th edition of the definitive Pillsbury-authored publication. Milling and baking are accented, but in broad range the information covers almost every food-processing facet.

Containing such data as conversion factors, measurement equivalents, composition of foods, nutrition, etc., it also offers pertinent material on Definitions and Standards of Identity for foods and ingredients, plant location factors, heating and ventilation, etc.

Microbes in Industry

INDUSTRIAL MICROBIOLOGY *by S. C. Prescott and C. G. Dunn. McGraw-Hill Pub. Co., 330 W. 42nd St., New York City 36. 1959. 945 p. Price:* $17.50.

Aim of this book, a revision of the standard book in the field, is to acquaint readers with basic information and literature references relating to use of yeasts, bacteria, and molds in industrial production.

New features include a chapter on the latest food-field antibiotics; revised alcoholic beverage production statistics; classification and methods of studying yeasts; and a section on enzyme production and uses.

Booklets & Reports

REPORT OF THE JOINT PROGRAM OF STUDIES ON THE DECONTAMINATION OF RADIOACTIVE WATERS *Published by U. S. Dept. of Health, Education, and Welfare, Washington 25, D. C.* $1. Joint research study on effectiveness of water treatment in removal of radioactive wastes.

FLOW OF BULK SOLIDS PROGRESS REPORT (*Bulletin No. 26*) *Published by Utah Engineering Experiment Station, University of Utah.* $1. Material covers flow properties, storage plants, designing.

CLOSING THE GAP *Published by Scientific Apparatus Makers Assn., 20 North Wacker Dr., Chicago 6.* 25¢. Bibliography of articles on "closing

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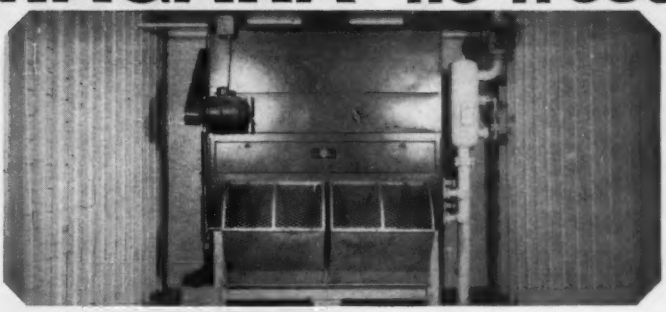

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CIRCLE 234 ON READER SERVICE CARD

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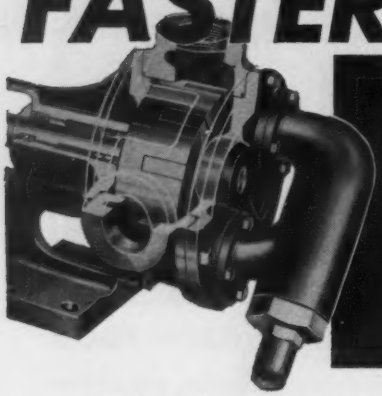

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CIRCLE 235 ON READER SERVICE CARD

the gap" between national awareness of a need for improvement of science instruction and facilities, and united local action.

COFFEE IN LATIN AMERICA *Published by Columbia University Press, 2960 Broadway, New York City 27.* $1.75. Productivity problems and future prospects in Columbia and El Salvador.

HOW TO CONTROL ACCOUNTS RECEIVABLE FOR GREATER PROFITS *Published by Dun & Bradstreet, 99 Church St., New York City 8.* $1. Handbook on function, control, and effective collection of receivables.

PROTECTION OF PAPER-PACKAGED FRUITS AND VEGETABLES DISPLAYED ON ICE (*Marketing Research Report No. 293*) *Published by USDA, Washington 25, D. C.* 5¢.

MARKETING RESEARCH IN ACTION *Published by American Marketing Assn., 27 East Monroe St., Chicago 3.* $2. Proceedings of the Sixth Biennial Institute of Marketing Research.

SUCCESSFUL MARKETING AT HOME AND ABROAD *Published by American Marketing Assn., 27 East Monroe St., Chicago 3.* $6. Papers presented at 40th annual meeting of AMA.

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PACKER MEET HEARS

Food & Drug Code Calls for Maximum of Zero In Retailer Warehouses, Trucks, Store Cases

A standard zero temperature for frozen food products through every stage of distribu- Association of Food and Drug Officials of the U. S. The zero temperature require- Packers convention in Chicago. Making the presentation was Dr. C. S. Brinsfield, chief, divi-

Frozen storage rooms of Armorply are sanitary and easy to keep clean.

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Cold storage rooms made of prefabricated Armorply modules maintain temperatures down to –100°F; go up fast, economically.

Provide reliable temperature control. Armorply rooms maintain constant temperatures, warm or cold. Armorply will not absorb odors, and the air-tight joinery of the Armorply modules affords protection against vapor and vermin.

Cut installation time. Armorply modules, as prefabricated by the Freezer Box Division of Annapolis Yacht Yard, Annapolis, Md., have a patented joint-locking device that eliminates sealing problems. Rooms can be assembled, expanded, dismantled and moved quickly with ordinary labor.

Cut installation costs. Armorply coolers can be installed directly on concrete slab, indoors or outdoors. In installation of freezing rooms, insulated floor sections are used. No masonry or other costly, space-taking construction is needed. And because the room can be installed quickly, you save on labor costs, too.

Cut maintenance. Armorply – metal-faced plywood–never needs to be painted and it wipes clean easily. Strong, highly impact-resistant Armorply minimizes the need for repairs; yet if damage should occur, single panels can be replaced.

Armorply, metal-faced Weldwood waterproof plywood, comes with faces of aluminum, stainless steel, zincbond steel, copper, or any other metal laminated to a variety of core types. Send the coupon for details and your free sample of Armorply.

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CIRCLE 163 ON READER SERVICE CARD 163

Inside view of a spotlessly clean Monel evaporator. Photo by Loebel.

How International uses a unique alloy to produce purer salt

The gleaming interior of the giant salt evaporator shown above is exposed to boiling brine for more than 150 hours each week. Yet not a trace of corrosion is ever seen—because the evaporator is made entirely of a unique copper/nickel alloy, Monel.

International Salt Company replaced older cast-iron evaporators with Monel because it is completely unaffected by pressures and temperatures in brine evaporation. Scale and other deposits never form on its smooth surface. Thus, the Sterling Salt produced in Monel units is of higher purity than was ever possible before.

Today, International has four corrosion-proof Monel evaporators (each 65 ft. high and weighing 25 tons) linked together at its Watkins Glen, N. Y., refinery. This is the salt industry's first all-Monel "quadruple-effect" evaporation system . . . with a capacity of over 600 tons a day.

In addition to improving salt purity, International's Research and Development program has perfected a variety of techniques which can help your company use salt more efficiently. Contact International Salt Company, Inc., Scranton, Penna., or any of the district offices listed below.

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Chocolate-Base Flavor Produced by Heat-Reacting Partially Hydrolyzed Egg White and Saccharide.—I. I. Rusoff, General Foods Corp., N.Y.C. No. 2,887,384.

Soluble Coffees Water-Extracted at Three Temperatures, Combined to Form Two Blends—A. P. Morrow, N. Hills, Pa. No. 2,888,349.

Self-Dissolving Tablets Containing Coffee Powder, Polyethylene Glycol, Sodium Bicarbonate, Alginic Acid.—D. F. Hinkley, Plainfield, N.J. No. 2,889,226.

Quick Cooking Cereal Containing Wheat Farina and Surface Active Hydratable Protein.—S. M. Cantor, Overbrook Hills, Pa. No. 2,890,117.

Confection Formed From Thermosetting Batter Subjected to Hot Pressure Mold.—C. H. Birnkrant, Birnkrant Confection Co., Beverly Hills, Calif. No. 2,890,958.

PROCESSING

Tenderizing Beef Diathermally by Internally Heating to About 105F. for 3¼ Min.—Hodges Research & Development Co., N.Y.C. No. 2,870,018.

Steam Blanching Foods So Nutrients Collected in Condensate Are Restored to Products.—Carrier Corp., Syracuse, N.Y. No. 2,870,020.

Preventing Struvite Formation by Introducing Aluminum Sulfate Into Thermally Treated Seafoods. — Blue Channel Corp., Port Royal, S.C. No. 2,870,025.

Subjecting Wheat to Multiple-Stage Heat and Moisture Treatment, Pressure-Steaming, Cooling, Drying, Pearling, Cracking and Screening.—Fisher Flouring Mills Co., Seattle. No. 2,884,327.

Concentrating Aqueous Coffee Extract Under Oxygenous Atmosphere.—Ramon Perech, N.Y.C. No. 2,872,323.

Preparing Cake Mix by Bonding Fragmented Sugar to Flour and Coating Both With Shortening.—Procter & Gamble, Cincinnati. No. 2,874,053.

Making Sausage Emulsion by Cutting and Cooling Space-Suspended Meat.—W. J. Fitzpatrick Co., Chicago. No. 2,874,054.

Preserving Cut Apples by Treating in Aqueous Salt-Fruit Acid Solution and Partially Dehydrating.— USDA. No. 2,874,059.

Freeze-Grinding Meats and Dissolving Released Myosin in Salt Going Into Ground-Meat Formula.—Oscar Mayer & Co., Chicago. No. 2,874,060.

Curing Meat With Nitrate-Nitrite Solution in Presence of Ascorbic Acid, Alkali Metal Bicarbonate and Glutamate.—S. Klein, Newark, N.J. No. 2,875,068.

Preserving Color of Green Vegetables By Immersing in Alkaline Solution Which Is Also Added to Interior Can Coating.—Patent Protection Corp., N.Y.C. No. 2,875,071.

Protecting Beer From Air by Covering Surface With Liquid Silicones.—A. L. Nugey, Rahway, N. J. No. 2,880,092.

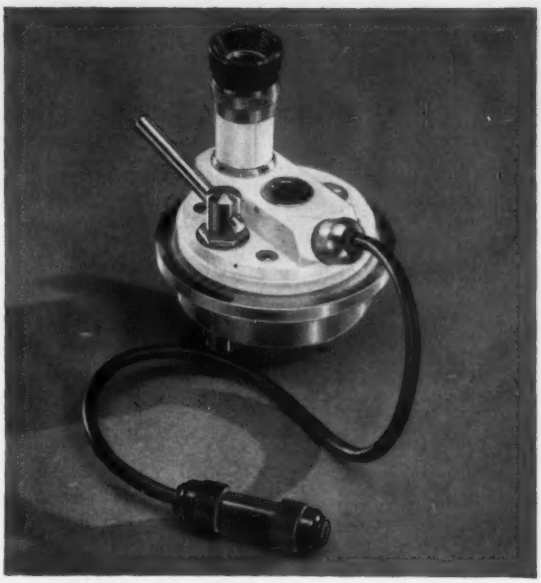
Improving Baking Properties of Flour by Preheating and Conveying in Pressurized Air Current.—C. Brabender, Wayzata, Minn. No. 2,880,093.

Producing Proteinaceous Product by Treating to Remove Most of Beany Taste.—Griffith Laboratories. Inc., Chicago. No. 2,881,076.

Dehydrating and Exposing Foods to Sound Energy to Aid Subsequent Processing.—L. G. Simjian, Reflectone Corp., Stamford, Conn. No. 2,881,079.

Tenderizing Foods by Enzyme and Sound Energy Treatments.

Want more information on any of these recent patents—if so, you many obtain detailed printed copies by writing direct to the U. S. Patent Office, Washington, D. C., giving serial numbers of those you want and enclosing 25¢ for each copy.



AO's Goldberg Process Refractometer Prevents Waste . . . Increases Profits

This in-stream Refractometer can be mounted in wall of process vessel, evaporator, vacuum pan, product pipe line or other location where continuous reading is desirable. Quickly determines total soluble solids in turbid and dark-colored concentrates such as jellies, jams, purees, juices and syrups.

1 **Prevents profit loss:** Determines exact endpoint of cooking batch by providing continuous, in-process readings of total solids. Prevents profit loss due to soluble solids "give away" by over concentration.

2 **Prevents product waste:** In-process readings on *hot* product eliminates old-fashioned external sampling with its consequent product waste and time loss. Savings in product alone, in most cases, will pay for the instrument in one season.

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4 **Three Brix ranges available:** 0-25%; 12-72%; 36-82% total soluble solids. Withstands pressure of 40 lbs. and temperatures ranging up to 250°F.

For further information write for Brochure SB10125

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INSTRUMENT DIVISION, BUFFALO 15, NEW YORK

–L. G. Simjian, Reflectone Corp., Stamford, Conn. No. 2,881,080.

Ripening Cheese by Subjecting to Compressional Waves of Frequency From 100-100,000 cps.–W. C. Winder, Wisconsin Alumni Research Foundation, Madison. No. 2,882,164.

Aerated Shortening by Introducing Gas Into Liquid Fat, Chilling, Crystallizing and Packing.–Lever Brothers Co., N.Y.C. No. 2,882,165.

Oven-Preparing Foods Under Pressure in Superheated Steam. –Vict. Th. Engwall & Co., Kommanditbolag, Sweden. No. 2,885,294.

Cold Smoking Food Products. –T. T. Huckabee, Albany, Ga. No. 2,893,879.

PACKAGING

Coating Perishables With Film-Forming Latex Composition.—Dow Chemical Co., Midland, Mich. No. 2,872,-325.

Cartoner Having Paperboard Box Set Up, Container Assembling-Inserting and Carton Sealing Stations. — Federal Paper Board Co., Bogota, N.J. No. 2,873,565.

Metering Carton for Delivering Pre-set Volume of Powdered Materials.–N. H. Cantor, Flushing, N.Y. No. 2,880,-915.

Filler for Collating and Loading Packages Into Cases.– C. L. Day, Crown Cork & Seal Co., Baltimore. No. 2,881,575.

Device for Pressure Filling Aerosol Containers.–R. B. Nebinger, Knapp-Monarch Co., St. Louis. No. 2,881,576.

Moldproof Cheese Package Consisting of Polyethylene-Coated Cellophane.–E. W. Kielsmeier, Swift & Co., Chicago. No. 2,882,169.

Compartmentized Turntable For Receiving and Packing Bags Into Containers.–N. Weisman, Modern Coffees, Boston. No. 2,882,658.

Missing Crown Detectors for Bottle-Capping Machines.–M. W. Gieskieng, Denver, Colorado. No. 2,883,810.

Butter Package Comprising 2 Units, Each With Plurality of Separably Connected Dishes. –F. H. Hanson, Oakland, Calif No. 2,884,155.

Tightly Packaging Foods by Imposing Stretching Stress on Package, Inserting Product and Releasing Stretch.–E. O. Johnson, Union Carbide Corp., N.Y.C. No. 2,884,328.

Cans Polyethylene Coating to Prevent Adherence of Cooked Meats.–E. C. Haskell, Interchemical Corp., N.Y.C. No. 2,885,293.

EQUIPMENT

Rack for Forming, Smoking and Cutting Sausage Products Like Frankfurters.—E. D. Lamppard, Grand View on the Hudson, N.Y. No. 2,874,403.

Coffee Bean Roaster Comprising Rotating Drum With Vanes, Pressure-Relief Valve, Temperature Measuring and Cooling Facilities. — Willy Brandl, Zurich, Switzerland. No. 2,874,483.

Aseptic System for Canning Products Under Pressure.— W. F. and John Barnes Co., Rockford, Ill. No. 2,874,523.

Unloader for Automatically Discharging Pans From Oven. —Capital Products Corp., Mechanicsburg, Pa. No. 2,874,-650.

Conveyor Weighing Scale.– L. J. Lyons, Fairbanks, Morse & Co., Chicago. No. 2,882,-036.

Continuous Automatic Plate Freezer.–Amerio Refrigerating Equipment Co., Union City, N.J. No. 2,882,697.

Scaler for Pressure-Extruding Dough.–G. A. Kruder, American Machine & Foundry Co., N.Y.C. No. 2,882,839.

Pallet Loader Comprising Apron, Pallet Support, Conveyors and Package Spacer-Counter. – Alvey Conveyor Mfg. Co., St. Louis. No. 2,883,074.

Shrimp Cleaner for Removing Shell, Deveining and Slitting. –N. Miller, St. Simons Island, Ga. No. 2,884,657.

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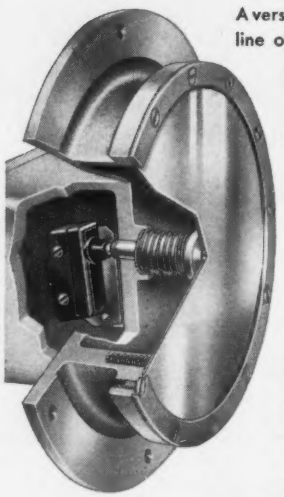
AUTOMATIC BIN LEVEL INDICATOR

A versatile addition to the Bin-Dicator line of bulk material level controls.



NEW corrosion-resistant construction

NEW stainless steel diaphragm

NEW super-sensitive operation

Explosion-proof and general purpose models listed by Underwriters' Laboratories, Inc.

Prevents overflowing of bins, clogging of conveyors, choking of elevators, damage to machinery; cuts operating costs. Provides simple, reliable, positive control at low cost.

WRITE
for Bulletin AB-19 or call
VAlley 2-6952

THE BIN-DICATOR CO.
13946-R Kercheval • Detroit 15, Mich.
*TM PATENT PENDING

WE SELL DIRECT • PHONE ORDERS COLLECT

CLASSIFIED SEARCHLIGHT SECTION ADVERTISING

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

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The advertising rate is $16.00 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

EMPLOYMENT OPPORTUNITIES—$37.00 per inch subject to agency commission

INFORMATION

DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

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(Not available for Equipment Advertising) $1.80 a line. Minimum 3 lines. To figure advance payment count 5 average words as a line. (See ¶ on Box Numbers.)

POSITION WANTED undisplayed rate is one half of above rate, payable in advance.

BOX NUMBERS count as one additional line.

Send New ADS or Inquiries to Class. Adv. of Food Engineering, P. O. Box 12, New York 36, N. Y., For Nov. Issue Closing October 23rd

EXECUTIVE CAN MANUFACTURING

Available after first of year on permanent, semi-permanent or consultant basis. ME: Record Impeccable, 30 yrs. experience Engineering, Production, Installation Plant Operation, both USA and Foreign experience. Will travel or locate. Fully capable of handling world wide operations of a Company with foreign interests in Can Making and Food Packing. Interviews can be arranged anywhere if firm interest is shown.

PW-2534, Food Engineering
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

ADDRESS BOX NO REPLIES TO: Box No. Classified Adv. Div. of this publication. Send to office nearest you.
NEW YORK 36: P. O. BOX 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

POSITIONS VACANT

Dairy Engineer—Engineer familiar with milk plant operations and instrumentation for C.I.P. cleaning to act as liaison and consultant between milk plants, and company furnishing instrumentation, equipment, and cleaning chemicals for milk plants. Permanent position with excellent future. Send resume to P-2655, Food Engineering.

Wanted: Qualified engineer, experienced in the designing and application of granular, liquid, semi-liquid and hand pack types of fillers for cans and jars. Write complete details of education, filler and other experience, compensation desired, etc. to W. I. Carlson, Director of Engineering, Chisholm-Ryder Company, Inc., Niagara Falls, New York. All replies will be treated strictly confidentially.

POSITIONS WANTED

Graduate engineer, age 30, broad plant engineering experience in foods, beverages, and grain. Now employed in Illinois. Seeking responsible engineering position with processing industry anywhere in U. S. PW-2752, Food Engineering.

Hindu Gourmet, manufacturer of complete India dinner seasonings and cocktail snappits seeks responsible position. PW-2722, Food Engineering.

Food Technologist, with extensive experience in manufacture, development, control, of a wide line of confectionery and chocolate products, desserts, cereal products, ice cream, and other food products, as well as laboratory direction, desires position of responsibility. PW-2672, Food Engineering.

SELLING OPPORTUNITY WANTED

Minneapolis Manufacturer's Agent with excellent food and grain industry contacts wants additional equipment line. Established 12 years with two mechanical engineers as sales staff. RA-2633, Food Engineering.

CONTRACT WORK WANTED

Mid-west canner, strategically located, seeking out of season arrangement for canning, freezing, or pre-packaging your products. Excellent sales outlets available. CWW-2755, Food Engineering.

An unusual opportunity for a
SALES ENGINEER

Must know layout. Attractive arrangement, salary plus incentive. A chance to grow with the leader in its field. Send resume to:

ALTO CORPORATION
333 Seventh Ave., York, Pa.

FOOD TECHNOLOGIST

24-30
Salary $7,200 to $8,800

Outstanding opportunity for young man in Research Department of young growing food concern. Minimum requirements B.S. in food technology. Locate in Houston, Texas.

Send resume to Uncle Ben's, Inc., P. O. Box 1752, Houston, Texas.

FOOD TECHNOLOGIST

Young man with some education and background in Food Technology and a real desire to sell. Position combines product development (Flavors for the food industries) and sales. Splendid opportunity for ambitious young man. Replies held confidential.

P-2701, Food Engineering
520 N. Michigan Ave., Chicago 11, Ill.

WE ARE MOVING
VALUES GALORE—BUY NOW

14—S.S. Kettles 40-150 Gallons.
2—Day D-10 Spiral Mixers 1000#.
1—Horiz. Sterilizer 42"x48"x96".
1—MRM—10 stem Vac. Filler, S.S.
1—Day 20 Gal. Monel, Jack. Sigma Blade Mixer.
1—B.P. 1 Gal. S.S. Jack. Sigma Blade Mixer.
2—Copper Conical Blenders 500# Each.
1—Resina Capper 28 to 53 mm. Caps.
1 #429 Standard Knapp Gluer & Sealer.
1—Syntron S.S. Vibroflow Feeder FO-6-9202. Type F-45.
1—Jeffrey Trayler S.S. Vibrating Screen 30"x68" Double Deck.
New S.S. Blenders, Kettles, Tanks.

Send for Bulletin A-43 for complete listings.

THE MACHINERY & EQUIPMENT CO.
293 Frelinghuysen Avenue, Newark 12, N. J.
TAlbot 4-2050.

FOR SALE

3—Cherry-Burrell Superhomo Homogenizers. (2) 1200 gal. per hour, (1) 930 gal. per hour, excellent condition, only used about six weeks out of each year.
3—Flexflo pumps for above.
1—Complete spare block for superhomos.
Machines may be inspected at any convenient time.

FS-2757, Food Engineering
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

U. S. Bottle Machinery Co. of Chicago, Ill.

1—**16 Head Rotary Filler & Pasteurizer & 4 Head Crowner.** 120 BPM 6-7 oz. Bottles. Purchased new June, 1946 Model G.F.C. #164. Serial #110. **Price $2,200.00.**

1—**Single End Heil Washer.** 6-7 oz. 12 wide Soaker. 120 BPM. Purchased new, June, 1946. **Price $800.00.**

This was in operation five years as a Tru-Ade filling line and is in perfect condition. Need the space, so must sell.

Siegler Bottling Co.
P. O. Box 7, Dayton View Station
2400-2422 N. Gettysburg Ave., Dayton 6, Ohio

MODERN PACKAGING EQUIPMENT

Savings: 50% and more
LESS THAN 10 YEARS OLD

• SPECIAL •

PNEUMATIC SCALE CO. Medium Double Package Makers
PNEUMATIC SCALE CO. Heat Seal Tea Bag Machines with Taggers, Counters and Stackers.
PNEUMATIC SCALE CO. High Speed Cartoning Lines—Feeders, Bottom Sealers, Rotary Fillers & Top Sealers.

PNEUMATIC SCALE CO. Synchronized Liquid Filling Line consisting of: Invert type Air Cleaner, 20 Spout Stainless Steel Filler, 4 head Rotary Capper, Duplex Labeler.
CARTER VACUFLOW. Model B, 16 Head Stainless Steel Powder Filler including 5 H.P. Nash Hytor Vacuum Pump . . . Also, Carter Vacuflow, Model B, 4 Head Stainless Steel Powder Filler.
RESINA, CAPEM, PNEUMATIC: 1, 3 and 4 Head Cappers.
PACKAGE MACHINERY, Models FA and FF, Wrappers.
KARL KIEFER, 24 Spout Stainless Steel Rotary Vacuum Filler, synchronized to Karl Kiefer Bottoms-Up Rotary Bottle Cleaner with worm infeed.
BATTLE CREEK, Model #46, Wrapping Machine, equipped with Oliver Heat Seal Label Attachment.
TRANSWRAPS, Models A and B.
FERGUSON PACKOMATIC CARTONING LINE.

Partial List—Send for complete list of equipment in stock

TOP PRICES FOR SURPLUS PACKAGING EQUIPMENT

ALLIED EQUIPMENT CO.
940-946 Nepperhan Ave., Yonkers 3, N. Y.
Phone: Yonkers 5-0442

LATE MODEL PACKAGE MACHINERY

Package Machinery, Model FA, Electric eye and tear tape attachment.
Package Machinery, Models FA. A2, F10J Bundler also Haysmen, Scandia.
Resina Capper, High Speed and Single.
Pneumatic Straight Line 20 Head Filler.
Pneumatic, Pony, World Labelers.
Horix, Karl Keifer, Ertel Fillers.
Pneumatic Scale High Speed Cartoning Line (also 30 CPM)
Standard Knapp #29 Case Sealers.
Standard Knapp High Speed Can Labelers.

PRECISION REBUILT and GUARANTEED

RPM INC
43 - 34TH STREET
BROOKLYN 32, NEW YORK
STerling 8-1550

IN STOCK AT LOEB'S . . . .

Cappers: Resina, Pneumatic Scale Swanson, Capem.
Cartoner: Ceco model 40-9½.
Centrifugals: Fletcher 12" Tolhurst 25" rubber.
Centrifugal: Tolhurst 20" type 316 st. st.
Clarifiers: De Laval and Sharples, st. st.
Crystallizers: 550 gal. st. st. jktd. agit.
Disintegrators: Rietz RD 18-P, steel, 75 hp.
Dryers: Link Belt Mono Tube monel.
Dryers: Devine 2 x 4 vac. drum st. steel.
Dryer: Stokes vacuum 2-shelf model 51.
Filler: Pfaudler 12 pocket juicer, st. steel.
Fillers: liquid vacuum, siphon, gravity.
Fillers: Stokes, Colton, Elgin, Geyer, M&S.
Fillers: powder Speedee, Triangle, Stokes & Smith.
Filler: Geyer 6 spout stain, steel.
Filter Presses: Sperry, Shriver 6"-36".
Filters: Int. pressure—Alsop, Sparkler, Lomax.
Gluer, carton: Stand Knapp, Ferguson, Triangle.
Homogenizers: 25, 60, 125, GPH.
Kettles: Deep 150 gal., jkt. 20 hp s.s. agit.
Kettles: Stain Steel with or without agitators.
Kettles: 20 gal. Groen gas fired, st. steel (New).
Labelers: Burt, Standard-Knapp, N. J. Pony Labelrites, Pneumatic Scale duplex.
Labeler: World auto. straightaway.
Mills, hammer: Mikro, Gump Prater, Raymond JayBee, Jeffrey, Williams, Fitzpatrick.
Cog stain. steel, 10 hp.
Mixers, dough type: single and double arm.
Glen Power Plus 340-qt. 5 hp.
Powder: 50 to 2000 lb. capacity.
Readco 140 qt. 4-speed.
Mullers: Simpson Lab., Simpson Lab, 18", Porte 39½".
Pan, Vacuum: Harris 42, stain. steel.
Pasteurizers: Cherry Burrell 200 gal., 300 gal.
Percolators: Pfaudler 54 x 42" stain. steel.
Pumps: Centrifugal, rotary, gear, vacuum.
Presses: Davenport 3A dewatering cont.
Tablet Presses: Single punch and rotary.
Tanks: Stain. steel 25 gal. to 1200 gal.
Tank: Pfaudler 2500 gal. glass lined.
Vacuum Tank: 3500 gal. st. steel.

Send us your inquiries and list of idle equipment

LOEB EQUIPMENT SUPPLY CO.
820 WEST SUPERIOR ST. • TELEPHONE SEeley 8-1431 CHICAGO 22, ILLINOIS

OCTOBER SPECIALS

Can casers: Burt Model P.C.E.—300 x 407.
Centrifugals: Tolhurst 40" bronze and 20" type 316 S/S.
Fillers: Stokes, Colton, Elgin, Speedy, Stokes & Smith. Pfaudler; piston, power and gravity and siphon.
Filters: Sparkler and Shriver.
Kettles: S/S 30 to 200 gallons.
Labelers: Burt, Standard Knapp and Pony.
Hammer Mills: Micro, Prater, Williams, J. B., Fitzpatrick.
Mixers: Powder type—Day, Marion, Gruendler and Areco.
Mixers: Single & double arm—Day, Baker Perkins, Triumph and Champion.
Tablet Presses: Single punch and rotary.
Tanks: 25 to 2,000 gals.

Wanted — surplus equipment, single items or entire plants.

AARON EQUIPMENT CO.
9370 Byron Street
Schiller Park, Illinois
Gladstone 1-1500

REMOVAL SALE

MOVING TO NEWARK, N. J.

Prices Slashed 20 to 50% on all Warehouse Stock

SPECIALS

2—Louisville 8' x 50' Hot Air Rotary Dryers, 304 S.S.
1—Harris 3' dia. 304 S.S. single effect Evaporator with coils.
1—Wyssmont 304 S.S. Turbo Dryer 6'2" x 10'4" high 24, shelves.
3—Buflovak Vacuum Shelf Dryers, 20—60" x 80" shelves.
1—Bird 18" x 28", 316 S.S. solid bowl, continuous Centrifuges.
1—Sparkler 33S28 Pressure Filter, 304 S.S.
1—Niagara 36H-110-3 Pressure Filter, 304 S.S.
2—Buflovak 42" x 120" atmospheric double drum Dryers.
4—Sweetland Filters, #7, #10, #12.
1—Devine Vacuum Shelf Dryer, 10—40" x 43" shelves.
1—Abbe, 1,000 lb. aluminum Power Mixer, 7½ H.P. motor.
1—Fitzpatrick Comminuting Machine, Model D, 7½ HP.

BRILL EQUIPMENT COMPANY
2401 Third Ave., New York 51, N. Y.
OR
4101 San Jacinto, Houston 4, Texas

SPECIAL

75—T316 STAINLESS Heat Exchangers, tubular, from 50 up to 200 sq. ft.

2—Oliver 5'3" x 3' rot. vacuum filters. T316 ss, ASME 25#
1—Niagara #510-28 vert. pressure-leaf filter, 500 sq. ft. T316 ss.
1—Niagara #36H-110-3, horiz. filter, 100 sq. ft. T304 ss.
2—Sharples Super-D-Canters, T316 ss.
2—Bird centrifugals, 18" x 28", 32" x 50", T304 ss.
1—Sparkler #33S-28 filter, T304 ss.
6—Buflovak double drum dryers; 42" x 120", 42" x 90", 32" x 72", 32" x 52".
5—Louisville rotary steam-tube dryers; 6' x 50', 6' x 30', 6' x 25'.
2—Davenport #1A dewatering presses.
2—Vac. Shelf Dryers, 108 sq. ft. T316 ss.
4—Sharples, Super-D-Hydrators, C-20, C-27, T316 ss.

T316 SS VACUUM TANKS: 6500, 3500, 1400, 1250, 560 gal.

PERRY EQUIPMENT Corp.
1411 N. 6th St. Phila. 22, Pa.
POplar 3-3503

SEARCHLIGHT EQUIPMENT LOCATING SERVICE

No Cost or Obligation

This service is aimed at helping you, the reader of "SEARCHLIGHT", to locate rebuilt and used Food processing equipment not currently advertised. (This service is for USER-BUYERS only.)

How to Use: Check the dealer ads to see if what you want is not currently advertised. If not, send us the specifications of the equipment and/or components wanted on the coupon below, or on your own company letterhead to

SEARCHLIGHT EQUIPMENT LOCATING SERVICE
FOOD ENGINEERING
Classified Advertising Division
P.O. Box 12, N. Y. 36, N. Y.

Your requirements will be brought promptly to the attention of the equipment dealers advertising in this section. You will receive replies directly from them.

Searchlight Equipment Locating Service
c/o Classified Advertising
Food Engineering
P.O. Box 12, N. Y. 36, N. Y.

Please help us locate the following equipment:

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NAME .....
TITLE .....
COMPANY .....
STREET .....
CITY .....ZONE....
STATE .....

10/59

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200 gal. S. S. Jacketed Kettle, 3 H. P. agitator
2760 & 3180 gal. S. S. Truck Tanks
200 gal. S. S. Tank, side agitator 36" x 48"
300 gal. S. S. Tanks top agitator
S. S. Plate Type Heat Exchangers
Worthington Air Compressor, 3 H. P.
1½" x 2" Waukesha Sanitary Pumps
50 gal. S. S. Tank, beater type agitator
15 to 50 H. P. Clayton Boilers
3 x 3 & 6½ x 6½ Ammonia Compressors
300 & 1000 gal. Horizontal Glass Lined Tanks
125 to 1500 Gal. S. S. Homogenizers
13 Robinson Mill 30 H. P.

"Send Us Your Inquiries"

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2581 Richmond Terrace Staten Island 3, N. Y.
Gibraltar 7-3410

FOR SALE

Hayssen Model 5-9 Automatic Wrapper
Model MPUS-15 Miller Wrapper
Model MPUS-17 Miller Wrapper & Sheeter
100 Gal. Copper Steam Jacketed Mixing Kettle
300 Gal. Copper Still with Condenser and Tank
100 Gal. Read Jacketed Double Armed Dough Mixer

SAVAGE BROS. CO.
2638 Gladys Ave. Chicago 12, Ill.

BUY WITH CONFIDENCE

2—Allis Chalmers 7 deck gyratory box sifters, 30" x 30".
2—Pfaudler glass lined reactors, 200 gallons and 500 gallons.
2—Fitzpatrick comminuters models D and K.
3—Ribbon blenders, 1000, 1200 and 2000# capacity.
1—Southwark 5 barrel jacketed Ben Franklin mixer.
1—Devine vacuum shelf dryer, 17 shelves, 40" x 43".

CHEMICAL & PROCESS MACHINERY Corp
52 9th St., Brooklyn 15, N. Y. *Hy 9-7200*

FIRST CLASS EQUIPMENT

from Your FIRST Source!

FMC Stainless Steel 10 Pocket Can Fillers, 200 a minute

Filler Mach. Co. Piston Fillers 1 to 11 Cylinders
FMC Hand Pack Fillers
Stokes & Smith TWIN HG Automatic Powder Filler

Mateer Stainless Steel Fillers

Capem, Resina, Pneumatic Aut. Multiple Head Cappers

Pn. Scale Aut. Air Bottle Cleaners

Triangle Elec-tri-Pak Automatic 4 Station Conveyor Type Filler

Ball & Jewell, Abbe Rotary Cutters

Standard Knapp Automatic #429, top and bottom Gluer & Sealer

Groen Type 316 Stainless Steel Jacketed 300 Gal. Kettle ASME

Stainless Steel Reactors from Laboratory Size to 2000 Gal.

Mixers, Vacuum Pans, Reactors, Juice Extractors, Pulpers etc., Dicers. Slicers, Peelers, Cutters.

Colloid Mills, Hammer Mills, Filters and Filter Presses.

Labelers, Case & Can Packers, Wrappers, Sealers, Packaging.

Dryers, Centrifugals, Evaporators

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PARKING ON THE PREMISES
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Complete Plant Layout — Engineering Service
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Serving the Food Processing Industry Since 1912

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WEBSTER, NEW YORK

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The Ruderman Machinery Exchange of Gouverneur, N. Y., one of the largest diversified Machinery & Equipment Dealers in America, can furnish you with practically all your needs in Modern Ice Cream, Milk Plant and Electrical Equipment at but a fraction of the original cost.

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RUDERMAN MACHINERY EXCHANGE
Gouverneur, New York Telephone 333-334

OCTOBER SPECIALS

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Standard-Knapp Can Labelers, all sizes.
World Twin Turret Labeler #C10006, 120 pm
Star & Hercules 20 & 50 Disc Filters
M. R. M. Rotary SS 12 Spt. Vac. Filler #1340
Langsenkamp Super Finisher or Pulper
Elgin 2 spout SS Piston Filler #5404
F. M. C. 12 pk't. SS Can Filler #120-MC160

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WHAT HAVE YOU FOR SALE?
You Can Bank On

EQUIPMENT CLEARING HOUSE, INC.
111 33 Street, Brooklyn 32, N. Y.
SOuth 8-4451—4452—8782

FOR SALE
1—FOOD MIXER

Stainless steel impeller type with rotating drum. Capacity 25 gal. Complete with motor and controls.

MANNESMANN-MEER, INC.
900 Line St. Easton, Penna.

BOILERS

HI-PRESSURE
Complete stock from 10-2,000 h.p.
Nation's largest inventory, New & Used
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MODERN REBUILT MACHINERY

UNION Rebuilt Machinery Established 1912

At Tremendous Savings

Baker Perkins 100 gal. Stainless Steel Sigma Blade Jacketed Mixer.
Package Machinery Models FA, FA-2, FA-3, FA-4 Wrappers. With and without Electric Eyes and Labeling Attachments.
Scandia SFS6F Automatic Wrappers with Electric Eyes. 140 per min.
Hayssen, Oliver, Package Machinery, Battle Creek, Hudson Sharp and Miller Wrappers—all sizes.
Pneumatic Scale High Speed Automatic Cartoning Lines with and without Liners and late style Tite Wrap.
Standard Knapp 429 Carton Sealers.
Ceco 3901 Carton Sealers.
Baker Perkins, Day, W. & P. Heavy Duty Jacketed Mixers, 2 to 150 gal.
Fitzpatrick Models D and DS, S.S. Comminuters.
Mikro Models 1SH, 2TH, 3TH, 4TH Pulverizers.
Langsenkamp Model A E-Z Adj. S.S. Pulper.
Fillers, Labelers, Cappers, all makes, sizes and capacities.

Complete Details and Prices on Request

UNION STANDARD EQUIPMENT CO.

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New York 12, N. Y.
Canal 6-5333-4-5-6

167 N. May Street
Chicago 7, Illinois
Seely 3-7845

WIRE US COLLECT!

FREEZE-DRYING EQUIPMENT

4—Complete Ultra High Vacuum Units

4—Vacuum Shelf Dryers, made by National Research Co (Naresco), each with Kinney Hi-Vacuum Pump and 5 HP Motor, Diffusion Pump. Naresco vapor freezing Condenser with scrapers. 16" inter-connecting piping, valves, instruments, gauges, trays, etc.

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Carrot oil, like butter, contains carotene. Carrot oil is extracted from carrots, and each pound contains up to 25 million units of carotene, the international standard of vitamin A activity. Carrot oil is preferred for vitaminising foods because it is a natural vegetable oil and because it contributes vitamin A activity of high stability and desirable golden yellow color. Carrot oil is not synthetic, does not contain animal fats of any kind, and does not produce fishy flavor.

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New 36-page combined catalog on carrot oil for foods, feeds, and pharmaceuticals. Important reading for most food processors. Write today!

NUTRITIONAL RESEARCH ASSOCIATES
205 Broad St., South Whitley, Ind.

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FOOD DEVELOPMENT LABORATORY
S. W. ARENSON, *Director*
Ingredient evaluation ● New Products development. Specializing in flour shortenings, milk and other basic ingredient ● ● Facilities, chemicals and physical laboratory, bakery, spray dryer and other unit process equipment.
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JUdson 6-1748-9

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Write For "Food Facts"
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Specialist in Canned and Glassed Foods Laboratory Services
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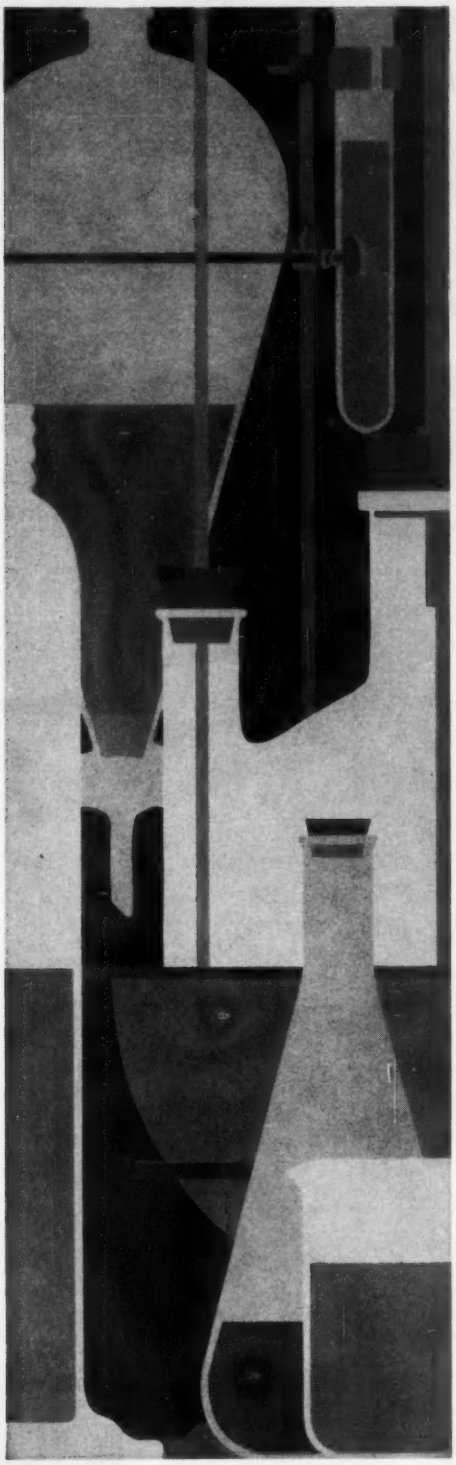

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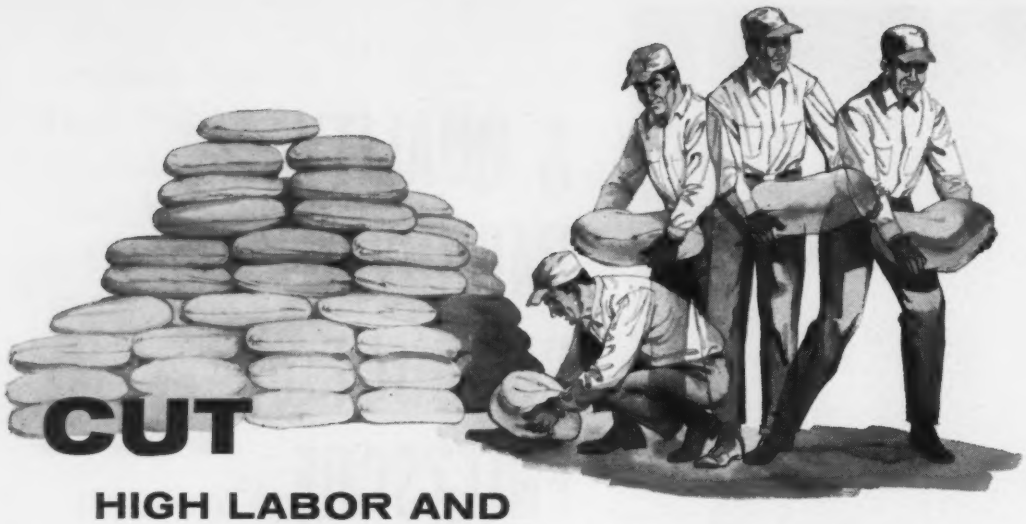

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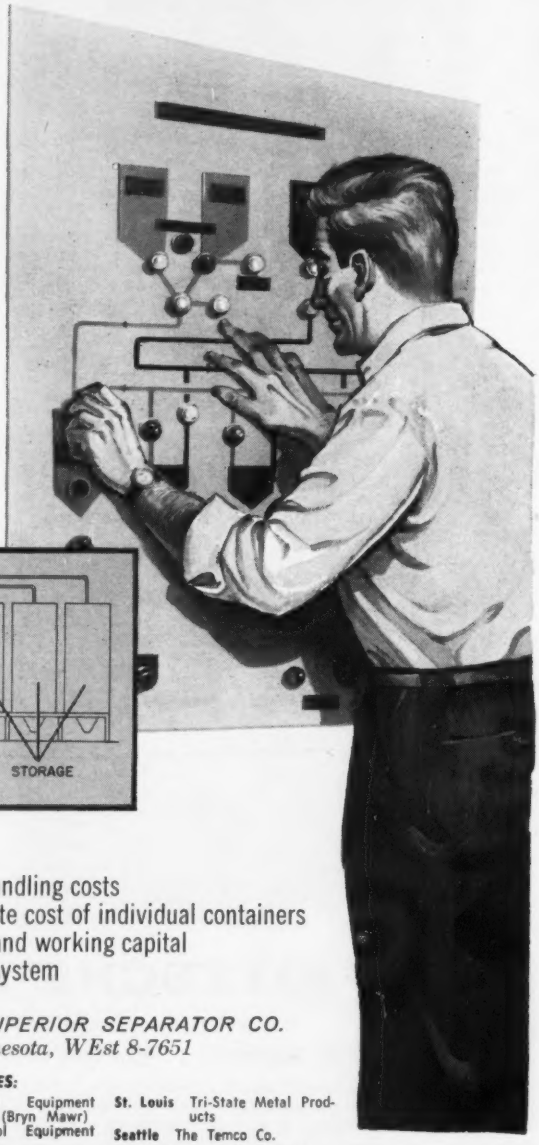

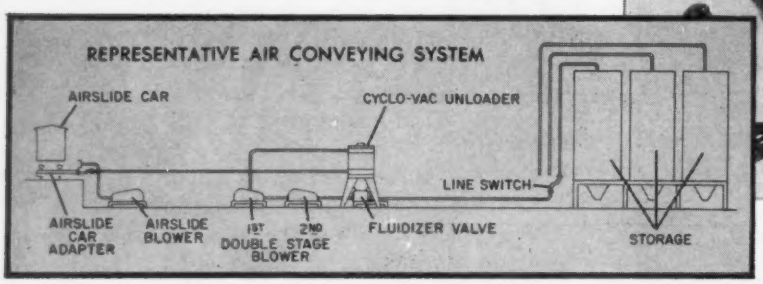

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